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RHEOPHILIC AND HYPORHEIC WATER MITES OF NEW ZEALAND

By David R. Cook

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RHEOPHILIC AND HYPORHEIC WATER MITES OF NEW ZEALAND¹

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INTRODUCTION

This publication is the first in a series dealing with the water mites of regions which were formerly part of Gondwanaland. The present work is based largely on collections made by the author during a collecting trip to New Zealand in October and November of 1982. Also included are two species described by Ceri Hopkins which were not recollected. A total of 93 species are illustrated and described, 73 of which are new. This paper serves two purposes. First, it greatly increases the known species of New Zealand water mites and, as the results appear as a single unit, should be useful to the non-specialist in identifying local species. To the latter end, keys are included for the more species-rich groups, Flabellifrontipoda, Limnesia, Australiobates and the Notoaturinae, and these taxa constitute nearly three-fourths of the known hydrachnid fauna. Secondly, the descriptions will serve, when combined with the future descriptions of water mites from other Gondwanan areas, as the basis for phylogenetic analyses of the relationships of the southern hydrachnids. Once these relationships have been satisfactorily worked out, the data can be used to determine the zoogeographic history of these mites.

As the title suggests, collecting was confined almost exclusively to flowing water situations. One exception was made, and Lake Ianthe on South Island was sampled to see if close relatives of the stream inhabiting species might not also occur in large, cool oligotrophic habitats. Three species were taken, of which, two belonged to predominately lentic groups, *Piona* and the typical subgenus of *Arrenurus*. The third species, a *Flabellifrontipoda*, is very closely related to one of the rheophilic species. The fact that this number of additional species was taken in a single collection suggest there are still many unknown forms in New Zealand lakes which, although they are much less zoogeographically interesting than the rheophilic mites, will increase the number of known hydrachnids of the country when adequate sampling is carried out. A rather large percentage of the stream inhabiting mites appear to be interstitial (= hyporheic) and these are discussed on page 124.

Nearly all the previous work on New Zealand water mites has been published by three individuals, Ceri Hopkins, Taiji Imamura and Vida Stout, and all of their relevant papers are included in the references section, whether or not they are cited in the text.

Primary types are to be deposited in the National Museum, Wellington. Measurements for the holotype and allotype are given first. If a number of paratypes are available, size variation is given in parentheses following the measurements of the primary types. In the case of previously described species, only the range of variation is presented.

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I wish to express my appreciation to Drs. Ceri Hopkins, Graeme Ramsay and Vida Stout for aiding the author in various ways either before or during the stay in New Zealand. Thanks also go to Dr. Francis Sanders for preparing the light microscope photographs and to Dr. Carmel Harkins for the scanning EM pictures. Special thanks go to my wife, Alice, for the good company, excellent map reading, and countless hours spent hunched over a collecting pan during the trip.

SYSTEMATIC SECTION

Subfamily ZELANDOTHYADINAE, new subfamily

<u>Diagnosis</u>: A red water mite with a soft, papillate integument; dorsal sclerites consisting of paired lateral eye plates placed at right angles to the long axis of body near anterior end; eyes pigmented; a reticulate, median plate surrounding the postocularia present posterior to the eye plates (fig. 9); coxae in four groups, with extensive associated apodemes, especially on posterior pairs (fig. 3); genital field with movable genital flaps partially covering three pairs of genital acetabula (fig. 5); acetabula slightly stalked; legs with numerous short setae but no swimming hairs; claws with numerous very small clawlets on each side (fig. 11); capitulum attached to a tube of soft integument to form protrusible mounthparts; capitulum normally completely withdrawn into the body; cheliceral claw long and stylet-like; dorsodistal portion of P-IV with two heavy setae; P-V with three small subterminal setae (fig. 8).

Type Genus: Zelandothyas, new genus, with the characters of the subfamily and \overline{Z} . diamphida is the type species.

Discussion: Adults of the genus exhibit a mixture of character states used to define the superfamilies Eylaoidea and Hydryphantoidea and, at present, the superfamily assignment is uncertain. An engorged larva was taken in one of the stream collections and allowed to metamorphose into a nymph assignable to the present mite. The cast larval integument is somewhat distorted but the important characters should be observable. This larva is to be described by Ian Smith and, as larvae usually are better indicators of higher relationships, will likely permit it to be placed with certainty in a superfamily and give hints as to its nearest relatives at the family level. It almost certainly belongs in a separate family but, as I have a distinctive new genus from Tasmania which appears to be close enough to be placed in the same family, wish to delay a family diagnosis until the latter can be incorporated. Autapomorphic character states of the present genus include the unusual lateral eye plates and median dorsal plate, as well as the unusual apodemes associated with the posterior coxal groups. The palp is somewhat "Limnochares"-like, but the two dorsodistal heavy setae on P-IV appear to be apomorphic. However, the new genus from Tasmania also shares a somewhat similar palp, including the two heavy setae on P-IV.

1. Zelandothyas diamphida, new species

(Figs. 1-9, 11)

Female: Body soft, integument papillate; body color a bright orange; body, not including the extensible capitulum, approximately 1370µm-1520µm in length; lateral eyes pigmented and lying on narrow sclerites arranged at right angles to long axis of body; a median, reticulate sclerite which surrounds the postocularia

lying immediately posterior to eye sclerites; this sclerite $532\mu m$ ($502\mu m$ - $608\mu\mathrm{m}$) in length, $304\mu\mathrm{m}$ ($304\mu\mathrm{m}$ - $319\mu\mathrm{m}$) in width; structure of these dorsal sclerites better illustrated (figs. 6, 9) than described; glandularia placed on non-papillate portions of the integument rather than on actual sclerites; anterior coxal groups close together medially and with posteriorly directed apodemes on posterior margins of second coxae; posterior coxal groups narrow and placed far apart on their respective sides; third coxae placed at right angles to long axis of body, fourth coxae extending more or less directly posteriorly; two extensive apodemes extending anteriorly from anterior margin of third coxae; the more lateral of these apodemes extending posteriorly below the lateral margin of the fourth coxae (indicated by broken lines in figure 1); coxae with numerous setae (fig. 3); genital field consisting of well developed genital flaps with irregular medial margins, these $214\mu m$ ($200\mu m-214\mu m$) in length; three pairs of genital acetabula regularly arranged medial to the flaps; the acetabula are actually somewhat stalked; figure 5 illustrates the structure of the genital field; excretory pore is only a slit in a non-papillate portion of integument rather than on a sclerite; capilulum attached to a tube of soft integument forming protrusible mouthparts; capilulum $288\mu m$ ($296\mu m$ - $303\mu m$) in length and is narrowed anteriorly and the mouth opening is terminal; chelicera $318\mu m$ ($311\mu m-318\mu m$) in length; cheliceral claw long and gradually tapering to a sharp point; figure 2 shows the structure of the chelicera; dorsal lengths of the palpal segments: P-I, 8µm (7µm- $8\mu m$); P-II, $34\mu m$ ($32\mu m$ - $33\mu m$); P-III, $38\mu m$ ($35\mu m$ - $38\mu m$); P-IV, $59\mu m$ ($62\mu m$ - $64\mu m$); P-V, $31\mu m$ ($32\mu m$); chaetotaxy of P-I, II and III simple; P-IV with two dorsal, thickened setae; P-V with three small subterminal setae; figure 8 shows the structure of the palp; figure 7 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 148 \mu m $(150\mu \text{m}-155\mu \text{m}); \text{I-Leg-5}, 170\mu \text{m} (163\mu \text{m}-170\mu \text{m}); \text{I-Leg-6}, 177\mu \text{m} (170\mu \text{m}-179\mu \text{m});$ figure 4 illustrates these segments; setae numerous on all legs; swimming hairs absent; claws with lateral serrations (fig. 11).

Male: Except for averaging slightly smaller, male is nearly identical in external morphology, and only measurements are given. Body approximately $1150\mu\text{m}-1290\mu\text{m}$ in length; reticulate dorsal plate $547\mu\text{m}$ ($478\mu\text{m}-502\mu\text{m}$) in length, $274\mu\text{m}$ ($278\mu\text{m}-289\mu\text{m}$) in width; acetabular plates $192\mu\text{m}$ ($185\mu\text{m}-192\mu\text{m}$) in length; capitulum $266\mu\text{m}$ ($252\mu\text{m}-266\mu\text{m}$) in length; chelicera $270\mu\text{m}$ ($263\mu\text{m}-273\mu\text{m}$) in length; dorsal lengths of the palpal segments: P-I, $5\mu\text{m}$ ($7\mu\text{m}$); P-II, $31\mu\text{m}$ ($32\mu\text{m}-34\mu\text{m}$); P-IV, $56\mu\text{m}$ ($54\mu\text{m}-55\mu\text{m}$); P-V, $26\mu\text{m}$ ($26\mu\text{m}-27\mu\text{m}$); dorsal lengths of the distal segments of the first leg: I-Leg-4, $146\mu\text{m}$ ($133\mu\text{m}-142\mu\text{m}$); I-Leg-5, $152\mu\text{m}$ ($145\mu\text{m}-157\mu\text{m}$); I-Leg-6, $167\mu\text{m}$ ($170\mu\text{m}$).

Holotype: Adult \(\text{, from a tributary of the Whangamoa River on Rt. 6, somewhat west of Rai Saddle (at Collins Valley Picnic Grounds), South Island, Nov. 6, 1982.

Allotype: Adult of, same data as holotype.

Paratypes: 3 of, 1 \, same data as holotype; 2 of, 1 \, Whangamoa River on Rt. 6, approximately 5 km northeast of Whangamoa Saddle, South Island, Nov. 23, 1982.

Family HYDRYPHANTIDAE thor

Subfamily WANDESIINAE Schwoerbel

Genus EUWANDESIA Andre and Naudo

2. Euwandesia tenebrio Hopkins and Schminke

(Figs. 10, 12-15)

Euwandesia tenebrio Hopkins and Schminke, 1970. Acarologia, 12: 357.

Nymph: Body soft and elongated; integument papillate; body approximately $900~\mu m$ in length; lateral eyes with associated pigment, these lying on an oval anterior portion of body indistinctly set off by integumental folds (fig. 12); the homologs of the small, median postocularia sclerite characteristic of adults of this genus are two small separated sclerites (fig. 10); these sclerites $17\mu m$ in length and bearing the postocularia; coxae as shown by Hopkins and Schminke for the adult; provisional genital field with two pairs of acetabula approximately $25\mu m$ in diameter; the acetabula on each side set in pits in the integument; a single seta on the outer edge of one side (fig. 13); dorsal lengths of the palpal segments: P-I, $17\mu m$; P-II, $40\mu m$; P-III, $38\mu m$; P-IV, $48\mu m$; P-V, $28\mu m$; P-V terminating in three enlarged setae; figure 15 illustrates the proportions and chaetotaxy of the palp; capitulum $170\mu m$ in length; chelicera $174\mu m$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $59\mu m$; I-Leg-5, $69\mu m$; I-Leg-6, $76\mu m$; figure 14 shows these segments.

Material Examined: Five engorged larvae taken in a sand bar of the Kaeo River on Waiare Road, 4 km south of junction with Rt. 10, North Island, Oct. 21, 1982. One of these larvae allowed to metamorphose and a nymph of *tenebrio* emerged. The mature nymph, on which the description is based, was collected in bottom deposits of Whale Creek on Rt. 6, west of Murchison, South Island, Nov. 7, 1982.

Discussion: It is possible to see the beginnings of the integumental flaps which partially cover the acetabula in the adult. There is even a single seta on the medial margin of the flaps in the nymph, the same area which in the adult a row of setae are found. Also, the medial postocularia platelet of the adult is represented by a pair of widely separated platelets in the nymph (fig. 10).

Subfamily PSEUDOHYDRYPHANTINAE Viets

Genus PSEUDOHYDRYPHANTES Viets

3. Pseudohydryphantes bebelus, new species

(Figs. 16-22)

<u>Female</u>: Length of body $729\mu m$; integument with low papillae; lateral eyes in capsules; median eye placed almost between the postocularia platelets; no dorsalia or lateralia present; sclerotization associated with glandularia forming a complete ring surrounding the gland portion; figure 20 shows the structure of the dorsum; length between anterior end of first coxae and posterior end of genital field $426\mu m$; coxae in four groups; tips of first, second and third coxae with short thickened setae; genital field extending between posterior coxal groups; excretory pore on a well developed sclerite; figure 16 illustrates the ventral sclerites; genital field $192\mu m$ in length, $120\mu m$ in width; genital flaps relatively long and narrow; three pairs of genital acetabula, the first pair the longest (fig. 17); dorsal lengths of the palpal segments: P-I, $46\mu m$; P-II, $78\mu m$; P-III, $50\mu m$ P-IV, 141

 μ m; P-V, 41μ m; figure 19 illustrates the proportions and chaetotaxy of the palp; capitulum 207μ m in length; chelicera 307μ m in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 108μ m; I-Leg-5, 126μ m; I-Leg-6, 144μ m; figure 22 shows these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 177μ m; IV-Leg-5, 189μ m; IV-Leg-6, 185μ m; III-Leg-3 with two swimming hairs; III-Leg-4 with eight swimming hairs; III-Leg-5 with 10 swimming hairs; IV-Leg-3 with two swimming hairs; IV-Leg-4 with seven swimming hairs; IV-Leg-5 with eight swimming hairs; figure 18 illustrates IV-Leg-4-6.

Male: Unknown.

Holotype: Adult \circ , from the Hope River on Rt. 6, between Glenhope and Kawatiri, South Island, Nov. 25, 1982.

<u>Discussion:</u> This is the only known water mite genus with an amphiarctic distribution. In addition to the New Zealand mite, three undescribed species are known from Australia and three species have previously been described from the northern portion of the holarctic region. The relationships of these species will be discussed in a paper on the Australian hydrachnids. The completely sclerotized ring surrounding the glandularia is sufficient to distinguish the New Zealand form from any of the others.

Family SPERCHONTIDAE Thor

Subfamily APELTOSPERCHONTINAE Cook

Genus APELTOSPERCHON Besch

4. Apeltosperchon zelandicus, new species

(Figs. 23-28)

Female: Length of body $562\mu m$ ($532\mu m$ - $608\mu m$) in length; length between anterior end of first coxae and posterior end of genital field $319\mu m$ ($350\mu m$ -364 µm); integument relatively smooth; dorsum without dorsalia but with small glandularia sclerites; eye lenses fused with the integument to form very low eye capsules, the anterior lens being much larger than the posterior lens (fig. 25); capitular bay large; anterior coxal groups separated medially; suture lines between first and second coxae branching, with one branch ending near tip of capitular bay; a gland on each side near tips of first coxae; a sclerotized strip on each side extending from anterior margin of third coxae to lateral margins of second coxae (fig. 27); no glandularia present on third coxae; length from anterior end of pregenital sclerite to posterior end of postgenital sclerite $140 \mu \mathrm{m}$ (155 μ m); width of genital field 78 μ m (85 μ m-89 μ m); three pairs of genital acetabula; genital flaps close together posteriorly, but well separated anteriorly; dorsal lengths of the palpal segments: P-I, $21\mu m$ ($19\mu m$ - $21\mu m$); P-II, 48 μm $(48\mu \text{m}-49\mu \text{m}); \text{ P-III}, 31\mu \text{m} (31\mu \text{m}-34\mu \text{m}); \text{ P-IV}, 52\mu \text{m} (54\mu \text{m}); \text{ P-V}, 27 \mu \text{m}$ $(27\mu m-31\mu m)$; both P-II and P-III with a heavy seta near ventral side; a heavy terminal seta on P-IV; figure 26 illustrates the proportions and chaetotaxy of the palp; capitulum $107\mu\mathrm{m}$ ($114\mu\mathrm{m}$) in length; chelicera $148\mu\mathrm{m}$ ($142\mu\mathrm{m}$ - $159\mu\mathrm{m}$) in length; figure 28 shows a lateral view of the capitulum and chelicera; dorsal lengths of the distal segments of the first leg: I-Leg-4, $69\mu m$ ($74\mu m$ - $76\mu m$); I-Leg-5, $76\mu m$ (83 μm -89 μm); I-Leg-6, $87\mu m$ (96 μm -103 μm); figure 23 shows these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg4, $116\mu m$ ($131\mu m$ - $138\mu m$); IV-Leg-5, $118\mu m$ ($128\mu m$ - $141\mu m$); IV-Leg-6, $121\mu m$ ($128\mu m$ - $138\mu m$); figure 24 shows IV-Leg-5 and 6; swimming hairs absent.

Male: Unknown.

Holotype: Adult \(\text{\text{\text{P}}}, \) from a tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), North Island, Oct. 27, 1982.

Paratypes: 1 \(\frac{1}{2} \), from the headwaters of Whangamata Stream, 10 km northwest of Taupo, North Island, Nov. 3, 1982; 1 \(\frac{1}{2} \), from a triputary of the Wakamarina River, 7 km southeast of Canvastown (off Rt. 6), South Island, Nov. 5, 1982.

Discussion: This is only the second species of the genus to be collected. The first, *Apeltosperchon schmitzi* Besch, was taken in the austral portion of Chile. The present species exhibits a much greater division into inner and outer portions of the second coxae. Also, the fourth coxae of *zelandicus* are only slightly longer than the third coxae and the palpal segments are proportionally shorter than in the species from Chile.

Family ANISITSIELLIDAE Koenike

Genus ANISITSIE LLIDES Lundblad

5. Anisitsiellides arraphus, new species

(Figs. 29-35)

Female: Dorsal shield $608\mu m$ in length, $410\mu m$ in width; dorsal shield bearing the postocularia and four pairs of glandularia; a pair of ridges present near lateral margins; dorsal furrow wide and containing five pairs of glandularia sclerites; ventral shield $669\mu m$ in length, $471\mu m$ in width; no separate sclerite present at anterior end of ventral shield; "glands of the third coxae" shifted far forward to a position on the second coxae (fig. 29); median coxal suture line evident; posterior suture lines of fourth coxae nearly obliterated; genital field $140\mu m$ in length, $111\mu m$ in width; genital flaps bearing only a few setae; three pairs of genital acetabula; dorsal lengths of the palpal segments: P-I, 21µm; P-II, $62\mu m$; P-III, $48\mu m$; P-IV, $100\mu m$; P-V, $22\mu m$; figure 32 shows the proportions and chaetotaxy of the palp; capitulum $98\mu m$ in length; chelicera $124\mu m$ in length; figure 33 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 83 µm; I-Leg-5, $93\mu\mathrm{m}$; I-Leg-6, $117\mu\mathrm{m}$; figure 31 illustrates these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $107\mu m$; IV-Leg-5, $114\mu m$; IV-Leg-6, 79μm; two very long swimming hairs present on IV-Leg-5; claws absent on IV-Leg-6; setae at tip of this segment short.

Male: Unknown.

Holotype: Adult \(\foatharrow\), from Te Whaiau Stream at junction of Rt. 47 and Roto-aria Road, North Island, June 5, 1981.

<u>Discussion</u>: This is the second "typical" *Anisitsiellides* known from New Zealand. Hopkins (1967) described *A. zelandicus* from a stream in the Tararua Mountains of southern North Island. Both these New Zealand forms differ from the two described from South America in having a completely fused ventral shield. The two South American species have a separate anterior sclerite similar to that shown for the following species (fig. 36). The present species differs from *zelandicus* in having a proportionally much shorter IV-Leg-6 relative to IV-Leg-5 and the three ventral setae of P-IV are placed much closer to the

distal end.

6. Anisitsiellides partitus, new species

(Figs. 36-42)

Female: Dorsal shield $456\mu m$ in length, $319\mu m$ in width; dorsal shield bearing the postocularia and four pairs of glandularia; dorsal furrow wide and with four pairs of glandularia flanking the posterior two-thirds of the dorsal shield; ventral shield 486 µm in length, 358 µm in width; a separate sclerite present at anterior end of ventral shield; "glands of the third coxae" shifted forward to the second coxae (but not as far forward as in any of the previously described species of the genus); median coxal suture line evident; posterior suture lines of fourth coxae nearly obliterated; genital field $96\mu m$ in length, $74\mu m$ in width; genital flaps bearing a few setae; three pairs of genital acetabula; figure 36 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $14\mu m$; P-II, $47\mu m$; P-III, $27\mu m$; P-IV, $60\mu m$; P-V, $22\mu m$; setal tubercles on ventral side of P-IV prominent; figure 41 shows the proportions and chaetotaxy of the palp; capitulum 86 µm in length; chelicera 96 µm in length; figure 40 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $52\mu m$; I-Leg-5, $55\mu m$; I-Leg-6, $79\mu m$; figure 42 illustrates these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $62\mu m$; IV-Leg-5, $66\mu m$; IV-Leg-6, $54\mu m$; one long swimming hair present on IV-Leg-5; claws absent on IV-Leg-6 (fig. 38).

Male: Unknown.

Holotype: Adult \(\phi\), from Whale Creek on Rt. 6, west of Murchison, South Island, Nov. 7, 1982.

Discussion: The present species differs most noticeably from all other species of the genus, both in New Zealand and South America, in having the "glands of the third coxae" not extending as far anteriorly, in having a well developed setal tubercle on P-IV (fig. 40), and possessing only one swimming hair on IV-Leg-5.

Family OXIDAE Viets

Genus FLABELLIFRONTIPODA Lundblad

Discussion: Kurt O. Viets (1978b) reviewed Flabellifrontipoda and pointed out that a number of character states originally used to define the genus were not confined to Flabellifrontipoda. I am in agreement with most of his conclusions and much of what is written below is only a further elaboration of the three main characters he discussed. (1) Claws: The presence of a comb of numerous ventral clawlets on the claws (figs. 79, 88) is the only character state not found in other oxids. Utilizing other members of the superfamily Lebertioidea for outgroup comparisons, it seems certain this claw morphology is derived for the genus Flabellifrontipoda. (2) Soft integumental projections at tip of first coxae: These projections appear to be artifacts of preservation and slide making. I believe them to be the linings of a pair of glands, with large openings, at tips of the first coxae. Each half of the gland is lined separately, so there usually are two integumental projections on each side. Depending on circumstances, both projections, one projection or none are everted. It seems that these linings are more likely to evert in Flabellifrontipoda than in other oxid genera, and they

do seem to show species differences. For example, they may be palmate as in the type species of the genus—similar to that shown in figure 57, or it may be pinnate (fig. 51) or smooth (fig. 66). However, the degree to which these structures evert is so variable as to make them unreliable for species diagnoses. (3) Median ventral suture line: This structure is probably the homolog of a rather extensive area of unsclerotized integument found in the nymphs of all oxids (fig. 99). As Viets points out, this suture is not always thin in Flabellifrontip-oda, and more commonly is apt to be only a median pore-free area. I also found this variation in the New Zealand species. For permanent mounts of members of this genus I orient them in lateral view after separating a mite into right and left halves. In some species the specimen will break perfectly in two along the suture line, indicating the presence of thin integument in this area. In most of the species, however, even bending the two halves back and forth to cause them to separate rarely results in the break coming at the suture line. In these cases there has been much greater fusion at the suture line.

There are two species in Australia, including Frontipoda tasmanica Kurt O. Viets, which are somewhat Flabellifrontipoda-like, but in which the median ventral suture line is discernible only along part of the venter and the claws do not bear a row of ventral clawlets. As Viets states, these should be in Frontipoda as presently defined. Only oxids with the numerous clawlets (and these species generally have a well developed median ventral suture line along the entire length) should be retained in Flabellifrontipoda. With basically only the claw character one hundred percent valid for distinguishing Frontipoda from Flabellifrontipoda, Viets made the latter a subgenus of the former. Here, because Flabellifrontipoda has geographic continuity (all are confined to Gondwanan areas and probably are exclusively austral) as well as possessing the claw character, it is tentatively retained as a genus, but I do not feel strongly either way about its taxonomic position.

KEY TO THE NEW ZEALAND SPECIES OF FLABELLIFRONTIPODA

1	Five pairs of glandularia present in the dorsal unsclerotized strip (fig. 43); five pairs of glandularia on posterior two-thirds of body (fig. 44)
2.	P-III longer than P-IV and P-V combined (figs. 91, 94, 96)
3.	P-IV fused with P-IV; P-III nearly four times as long as high (fig. 94) F. reductipalpa, new species(p. 17) P-IV and P-V not fused; P-III proportionally much shorter and stockier, roughly two or less times as long as high
4.	Body relatively long and narrow (fig. 90); P-II approximately twice as long as high (fig. 91); IV-Leg-5 with six or seven swimming hairs

5.	Setae at tip of IV-Leg-6 nearly same length as IV-Leg-5 and 6 combined; IV-Leg-5 with three or four swimming hairs
6.	Two long setae near tip of IV-Leg-6; genital acetabula placed relatively close together (figs. 51, 56) F. hadinoma, new species (p. 10)
	Three long setae near tip of IV-Leg-6; genital acetabula spaced relatively far from each other (figs. 57, 63) F. mastigophora, new species (p. 11)
-	
7,.	One of the posteroventral four pairs of coxal glandularia placed relatively far forward (fig. 82, arrow); setae at tip of IV-Leg-6 longer than that segment (fig. 85) F. zelandica Hopkins
	far forward (fig. 66); setae at tip of IV-Leg-6 shorter than the segment (fig. 71)
8.	Very large species (760 μm in length, 616 μm in height; deeply pigmented; inhabits lakes F. lacustris, new species(p. 12) Smaller species (up to 700μm in length, 547μm in height); not deeply pigmented; inhabits rheophilic habitats
	F. bravana, new species (p. 13)

7. Flabellifrontipoda smithi, new species

(Figs. 43-49)

Female: Length of body $623\mu m$ ($532\mu m$ - $653\mu m$); height of body $364\mu m$ $(297\mu m-402\mu m)$; coxae greatly expanded and occupying all of body except for a median unsclerotized strip extending from anterior end dorsally to the genital field; unsclerotized strip with paired postocularia platelets, three narrow median sclerites and five pairs of glandularia (fig. 43); posterior two-thirds of coxal area bearing only five pairs of glandularia (fig. 44). genital flaps 159 µm (133 µm- $155\mu\mathrm{m}$) in length; three pairs of genital acetabula; excretory pore on a small weakly sclerotized plate immediately posterior to genital field; median ventral suture line evident; dorsal lengths of the palpal segments: P-I, $25\mu m$ ($24\mu m$ - $26\mu m$); P-II, $30\mu m$ ($26\mu m$ - $33\mu m$); P-III, $24\mu m$ ($22\mu m$ - $24\mu m$); P-IV, $33\mu m$ $(31\mu\text{m}-35\mu\text{m}); \text{ P-V}, 14\mu\text{m} (12\mu\text{m}-14\mu\text{m}); \text{ ventral side of P-IV noticeably expanded}$ and rounded; figure 49 shows the proportions and chaetotaxy of the palp; capitulum $114\mu m$ ($104\mu m$ – $126\mu m$) in length; chelicera $100\mu m$ ($97\mu m$ – $107\mu m$) in length; figure 45 illustrates a lateral view of the capitulum, chelicera and palp; dorsal lengths of the segments of the first leg: I-Leg-1, $39\mu m$ ($36\mu m$ - $40\mu m$); I-Leg-2, $35\mu m$ ($31\mu m - 34\mu m$); I-Leg-3, $25\mu m$ ($23\mu m - 26\mu m$); I-Leg-4, $55\mu m$ ($45\mu m 60\mu \text{m}$); I-Leg-5, $71\mu \text{m}$ ($59\mu \text{m}$ - $76\mu \text{m}$); I-Leg-6, $85\mu \text{m}$ ($69\mu \text{m}$ - $93\mu \text{m}$); claws with numerous clawlets; figure 47 shows the proportions and chaetotaxy of the first leg; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $69\mu m$ $(59\mu m - 72\mu m)$; IV-Leg-5, $76\mu m$ $(66\mu m - 89\mu m)$; IV-Leg-6, $72\mu m$ $(56\mu m - 68\mu m)$; longest seta at tip of IV-Leg-6, $90\mu m$ ($87\mu m$ - $99\mu m$) in length; figure 46 shows

IV-Leg-5 and 6.

Male: Similar to female but averaging smaller and genital flaps are proportionally much shorter; length of body $471\mu m$ ($480\mu m$ – $532\mu m$); height of body $270\mu m$ ($274\mu m$ – $304\mu m$); genital flaps $93\mu m$ ($87\mu m$ – $89\mu m$) in length; dorsal lengths of the palpal segments: P-I, $21\mu m$ ($21\mu m$ – $24\mu m$); P-II, $26\mu m$ ($24\mu m$ – $27\mu m$); P-III, $22\mu m$ ($23\mu m$ – $24\mu m$); P-IV, $28\mu m$ ($29\mu m$ – $30\mu m$); P-V, $11\mu m$ ($10\mu m$ – $12\mu m$); capitulum $96\mu m$ ($100\mu m$ – $107\mu m$) in length; chelicera $76\mu m$ ($82\mu m$ – $84\mu m$) in length; dorsal lengths of the segments of the first leg: I-Leg-1, $36\mu m$ ($34\mu m$); I-Leg-2, $28\mu m$ ($29\mu m$ – $31\mu m$); I-Leg-3, $23\mu m$ ($24\mu m$ – $25\mu m$); I-Leg-4, $40\mu m$ ($45\mu m$ – $46\mu m$); I-Leg-5, $55\mu m$ ($58\mu m$ – $60\mu m$); I-Leg-6, $72\mu m$ ($69\mu m$ – $76\mu m$); dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $55\mu m$ ($55\mu m$ – $57\mu m$); IV-Leg-5, $67\mu m$ ($60\mu m$ – $63\mu m$); IV-Leg-6, $62\mu m$ ($52\mu m$ – $58\mu m$); longest seta at tip of IV-Leg-6, $72\mu m$ ($69\mu m$ – $86\mu m$) in length.

Holotype: Adult 9, from the Shag River near its headwaters on Rt. 85,

2 km west of Pigroot Summit (Central Otago), Nov. 16, 1982.

Allotype: Adult of, same data as holotype.

Paratypes: NORTH ISLAND: 2 \, from Orauhora Stream on Rt. 30, between Barryville and Benneydale, June 6, 1981; 1 ♂, 5 ♀, from Pohue Stream at Waiomu (Coromandel Peninsula), Oct. 26, 1982; 1 \(\sigma\), tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), Oct. 27, 1982; 4 of, 6 ♀, from Torere River at Torere on Rt. 35 north of Opotiki, Oct. 28, 1982; 3 of, 2 ♀, stream 1 km north of Tohere (east of Opotiki), Oct. 29, 1982; 1 of, 2 ♀, from stream at Omaukoro Bridge on Rt. 2, in the "Gorge" south of Opotiki, Oct. 29, 1982; 2 of, 1 after the Orange of Stream on Rt. 30 between Bennydale and Barryville, Oct. 31, 1982; 12, from Otupoto Stream on Rt. 32, west of Lake Taupo, Nov. 3, 1982; SOUTH ISLAND: 12, from the Whangamoa River on Rt. 6, 3 km northeast of Whangamoa Saddle (north of Nelson), Nov. 6, 1982; 2 9, from Whale Creek on Rt. 6, west of Murchison, Nov. 7, 1982; 2 ♂, 7 ♀, Potters Creek on Rt. 6, between Bruce Bay and Lake Paringa (north of Haast), Nov. 10, 1982; 1, from Boyd Creek on Rt. 94, 76 km south of Milford Sound, Nov. 14, 1982; 4 of, 17 ♀, same data as holotype; 1♀, White Rock River (southwest of Timaru), where Cliffs Road branches off Pareora Cave Road, Nov. 18, 1982; 4 ♂, 46 ♀, from the Oaro River at Oaro, on Rt. 1, approx. 20 km south of Kaikoura, Nov. 19, 1982; 2 of, Hope River on Rt. 6, between Glenhope and Kawatiri, Nov. 25, 1982.

Discussion: This is the only New Zealand species of *Flabellifrontipoda* with glandularia lying in the dorsal unsclerotized strip, but shares this characteristic with species from both Australia and South America. However, the present species has a proportionally less high body than these other species and P-IV is more expanded and ventrally rounded in *smithi* (fig. 49). The relationships of all the species of the genus will be discussed in a paper treating the Australian fauna.

8. Flabellifrontipoda hadinoma, new species

(Figs. 50-56)

<u>Male</u>: Length of body $744\mu m$ ($672\mu m$ – $744\mu m$); height of body $440\mu m$ ($411\mu m$ – $440\mu m$); coxae greatly expanded and occupying all of body except for a median unsclerotized strip extending from anterior end of body dorsally to the genital field; unsclerotized strip with paired postocularia platelets, three narrow, median sclerites and three pairs of lyrifissures (fig. 50); posterior two-thirds of coxal area bearing 10 pairs of glandularia; body gradually tapering when viewed

laterally (fig. 51); genital flaps $140\mu m$ ($122\mu m$ - $140\mu m$) in length; three pairs of acetabula; excretory pore on a small, weakly sclerotized area immediately posterior to the genital field; median ventral suture line evident; dorsal lengths of the palpal segments: P-I, $29\mu m$ ($29\mu m-30\mu m$); P-II, $35\mu m$ ($36\mu m-38\mu m$); P-III, $35\mu \text{m}$ ($31\mu \text{m} - 36\mu \text{m}$); P-IV, $53\mu \text{m}$ ($50\mu \text{m} - 53\mu \text{m}$); P-V, $21\mu \text{m}$ ($19\mu \text{m} - 22\mu \text{m}$); figure 54 shows the proportions and chaetotaxy of the palp; capitulum $150\mu m$ (148 μm - $159\mu m$) in length; chelicera $137\mu m$ ($124\mu m$ - $133\mu m$) in length; figure 52 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the segments of the first leg: I-Leg-1, $48\mu m$ ($43\mu m-46\mu m$); I-Leg-2, $46\mu m$ ($42\mu m-45\mu m$); I-Leg-3, $48\mu m$ ($42\mu m-47\mu m$); I-Leg-4, $66\mu m$ ($62\mu m-65\mu m$); I-Leg-5, $86\mu m$ $(83\mu \text{m}-89\mu \text{m})$; I-Leg-6, $104\mu \text{m}$ ($100\mu \text{m}-104\mu \text{m}$); claws with numerous clawlets; figure 53 shows the structure of the first leg; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $93\mu m$ ($83\mu m$ - $96\mu m$); IV-Leg-5, $104\mu m$ ($93\mu m$ - $107\mu m$); IV-Leg-6, 83μ ($66\mu m$ - $83\mu m$); tip of IV-Leg-6 with two very long setae, $159\mu\mathrm{m}$ ($149\mu\mathrm{m}$ - $183\mu\mathrm{m}$) in length; two or three swimming hairs present on IV-Leg-5; figure 55 shows IV-Leg-5 and 6.

Female: Similar to male but genital field is proportionally longer; length of body $\overline{745\mu m}$ (699 μ m-805 μ m); height of body 425μ m (410 μ m-456 μ m); genital flaps 174 μ m (163 μ m-185 μ m) in length; dorsal lengths of the segments of the first leg: I-Leg-1, 50 μ m (44 μ m-49 μ m); I-Leg-2, 45 μ m (44 μ m-45 μ m); I-Leg-3, 45 μ m (46 μ m-48 μ m); I-Leg-4, 67 μ m (66 μ m-69 μ m); I-Leg-5, 83 μ m (85 μ m-87 μ m); I-Leg-6, 79 μ m (73 μ m-76 μ m); two long setae present at tip of IV-Leg-6, these 162 μ m-166 μ m in length.

Holotype: Adult of, from a stream at Owhiritoa Bridge on Rt. 2, in the "Gorge" south of Opotiki, North Island, Oct. 29, 1982.

Allotype: Adult ♀, same data as holotype.

Paratypes: NORTH ISLAND: 1 of, from stream at Sandy's Bridge on Rt. 2, between Opotiki and Gisborne, June 3, 1981; 1 of, from a stream 1 km north of Tohere, on Rt. 35 east of Opotiki, Oct. 29, 1982; 11 o, 9 ♀, same data as holotype; 1 of, 5 ♀, from stream at Opato Bridge on Rt. 2, south of Opotiki, Oct. 29, 1982; 26 ♂, 22 ♀, from stream at Sandy's Bridge on Rt. 2, in ''Gorge'' south of Opotiki, Oct. 29, 1982; 9 of, 7 \, from stream at Gerrards Bridge on Rt. 2, in "Gorge" south of Opotiki, Oct. 29, 1982; SOUTH ISLAND: 12, from Graham Stream on Rt. 6, at picnic grounds 8 km northeast of Whangamoa Saddle, Nov. 6, 1982; 5 ♂, 2 ♀, from Whangamoa River on Rt. 6, 3 km northeast of Whangamoa Saddle (north of Nelson), Nov. 6, 1982; 1 ♂, 3 ♀, from a tributary of the Motupiko River on Rt. 6 between Korere and Glenhope, Nov. 7, 1982; 1 of, Four Mile River on Rt. 6, between Charleston and Tiromoana, Nov. 8. 1982; 5 of, 8 9, in MacLennan River at bridge on Aurora Creek Rd. (Catlins State Forest area) between Puketiro and Rt. 92, Nov. 12, 1982; 1 of, from Dunton Creek on Rt. 94, 85 km south of Milford Sound, Nov. 14, 1982; 11 of, 10 of, from Whangamoa River on Rt. 6, approx. 5 km northeast of Whangamoa Saddle, Nov. 23, 1982,

Discussion: The two whip-like setae on IV-Leg-6 which are nearly as long as IV-Leg-5 and 6 combined (fig. 55) are diagnostic.

9. Flabellifrontipoda mastigophora, new species

(Figs. 57-64)

<u>Female</u>: Length of body $449\mu m$; height of body $272\mu m$; coxae greatly expanded and occupying all of body except for a median unsclerotized strip extending from anterior end of dorsum to genital field; unsclerotized strip with

paired postocularia platelets, five short, narrow median sclerites and three pairs of lyrifissures (fig. 58); posterior two-thirds of coxal area bearing 10 pairs of glandularia (fig. 57); genital flaps 126µm in length; three pairs of genital acetabula, these small and widely separated from each other; excretory pore on a small indistinct sclerite posterior to genital field; median ventral suture line well developed; dorsal lengths of the palpal segments: P-I, $21\mu m$; P-II, $25\mu \text{m}$; P-III, $25\mu \text{m}$; P-IV, $27\mu \text{m}$; P-V, $9\mu \text{m}$; P-III noticeably expanded distally; figure 61 shows the proportions and chaetotaxy of the palp; capitulum $86\mu m$ in length; chelicera 76µm in length; capitulum and chelicera as shown for the male; dorsal lengths of the segments of the first leg: I-Leg-1, $33\mu m$; I-Leg-2, $27\mu m$; I-Leg-3, $24\mu m$; I-Leg-4, $38\mu m$; I-Leg-5, $52\mu m$; I-Leg-6, $62\mu m$; claws with numerous clawlets; figure 60 shows the proportions and chaetotaxy of the first leg; dorsal lengths of the distal segments of the forth leg: IV-Leg-4, $55\mu m$; IV-Leg-5, $69\mu m$; IV-Leg-6, $59\mu m$; IV-Leg-6 terminating in three long setae, the longest of which is 138µm in length; IV-Leg-5 with three or four long swimming hairs. figure 64 shows IV-Leg-5 and 6.

Male: Similar to female except in proportions of the genital field; length of body $456\mu m$; height of body $289\mu m$; genital flaps $79\mu m$ in length; three pairs of genital acetabula, these small and well separated from each other (fig. 63) but not to the extent found in female; dorsal lengths of the palpal segments: P-I, $22\mu m$; P-II, $27\mu m$; P-III, $28\mu m$; P-IV, $29\mu m$; P-V, $9\mu m$; capitulum $90\mu m$ in length; chelicera $80\mu m$ in length; dorsal lengths of the segments of the first leg: I-Leg-1, $32\mu m$; I-Leg-2, $25\mu m$; I-Leg-3, $24\mu m$; I-Leg-4, $41\mu m$; I-Leg-5, $58\mu m$; I-Leg-6, $68\mu m$; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $60\mu m$; IV-Leg-5, $70\mu m$; IV-Leg-6, $49\mu m$; three long setae at tip of IV-Leg-6, the longest of which is $121\mu m$.

Holotype: Adult \(\foats, \) from Waitaanga Stream near the town of the same name, on Rt. 40 west of Ohura, North Island, Oct. 31, 1982.

Allotype: Adult of, from Four Mile River on Rt. 6, between Charleston and Tiromoana, South Island, Nov. 8, 1982.

Discussion: The three long setae at tip of IV-Leg-6, which are approximately same length as IV-Leg-5 and 6 combined, plus the presence of widely separated acetabula, are diagnostic.

10. Flabellifrontipoda lacustris, new species

(Figs. 65-71)

<u>Female</u>: Length of body 760μm; height of body 616μm; body relatively wide, approximately 410μm in width; coxae greatly expanded and occupying all of the body except for a median strip extending from anterior end of dorsum to genital field; unsclerotized strip with paired postocularia platelets, three narrow, median sclerites and three pairs of lyrifissures (fig. 69); posterior two-thirds of coxal area bearing 10 pairs of glandularia (although epimeroglandularia 1 placed so far posteriorly that they may appear as an eleventh pair--fig. 66); genital flaps 192μ m in length; three pairs of genital acetabula, these elongated and are placed close together; excretory pore on a small weak sclerite immediately posterior to genital field; median ventral suture line well developed; dorsal lengths of the palpal segments: P-I, 39μ m; P-II, 43μ m; P-III, 36μ m; P-IV, 59μ m; P-V, 19μ m; figure 68 shows the proportions and chaetotaxy of the palp; capitulum 149μ m in length; chelicera 128μ m in length; figure 70 shows a lateral view of the capitulum and chelicera; dorsal lengths of the segments of the first leg: I-Leg-1, 53μ m; I-Leg-2, 52μ m; I-Leg-3, 42μ m; I-Leg-4, 73μ m; I-Leg-5,

 $104\mu m$; I-Leg-6, $107\mu m$; claws with numerous clawlets; figure 67 illustrates the proportions and chaetotaxy of the first leg; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $145\mu m$; IV-Leg-5, $193\mu m$; IV-Leg-6, $183\mu m$; tip of IV-Leg-6 with two elongated setae (fig. 71), these $107\mu m$ in length; IV-Leg-5 with 11-12 swimming hairs,

Male: Unknown.

Holotype: Adult \(\begin{aligned} \text{, from Lake Ianthe on Rt. 6, between Pukekura and Evans Creek, South Island, Nov. 9, 1982.

Discussion: The present species closely resembles the following species. See remarks under the latter.

ll. Flabellifrontipoda bravana, new species

(Figs. 72-77, 81)

Female: Length of body $608\mu m$ ($668\mu m$ - $699\mu m$); height of body $486\mu m$ $(502\mu \text{m}-547\mu \text{m})$; coxae greatly expanded and occupying all of body except for a median unsclerotized strip extending from anterior end of body dorsally to the genital field; unsclerotized strip with paired postocularia platelets, three narrow median sclerites and three pairs of lyrifissures (fig. 76); posterior twothirds of coxal area bearing 10 pairs of glandularia (epimeroglandularia l are placed sufficiently far posteriorly as to appear as an 1lth pair); body more or less rounded posteriorly when viewed laterally (fig. 73); genital flaps $167\mu\mathrm{m}$ $(167\mu m-228\mu m)$ in length; three pairs of genital acetabula, these elongated and placed close together on their respective sides; excretory pore lying on a small sclerite immediately posterior to genital field; median ventral suture line well developed; dorsal lengths of the palpal segments: P-I, $34\mu m$ ($25\mu m$ - $41\mu m$); P-II, $42\mu m$ ($41\mu m-45\mu m$); P-III, $35\mu m$ ($36\mu m-41\mu m$); P-IV, $46\mu m$ ($48\mu m-55\mu m$); P-V, $17\mu \text{m}$ ($16\mu \text{m}$ - $20\mu \text{m}$); palp as illustrated for male; capitulum $135\mu \text{m}$ (138 μ m-162 μ m) in length; dorsal lengths of the segments of the first leg: I-Leg-1, $55\mu \text{m}$ ($52\mu \text{m} - 62\mu \text{m}$); I-Leg-2, $45\mu \text{m}$ ($47\mu \text{m} - 52\mu \text{m}$); I-Leg-3, $36\mu \text{m}$ ($38\mu \text{m} - 45\mu \text{m}$) μ m); I-Leg-4, 62 μ m (65 μ m-79 μ m); I-Leg-5, 86 μ m (91 μ m-100 μ m); I-Leg-6, $93\mu m$ ($96\mu m$ - $107\mu m$); claws with numerous clawlets; structure of first leg is similar to that illustrated for male; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $118\mu m$ ($123\mu m$ - $133\mu m$); IV-Leg-5, $155\mu m$ ($168\mu m$ - $177\mu m$); IV-Leg-6, $163\mu m$ ($163\mu m$ - $177\mu m$); two elongated setae at tip of IV-Leg-6, these $90\mu \text{m}$ ($90\mu \text{m}$ -114 μm) in length; IV-Leg-5 with 9-11 swimming hairs.

Male: Similar to female but averaging smaller and genital field proportionally shorter; length of body 608μm (525μm-653μm); height of body is 486μm (410μm-502μm); genital flaps 130μm (121μm-144μm) in length; dorsal lengths of the palpal segments: P-I, 33μm (31μm-39μm); P-II, 41μm (36μm-43μm); P-III, 38μm (31μm-38μm); P-IV, 47μ (45μm-52μm); P-V, 17μm (17μm-19μm); figure 81 shows the proportions and chaetotaxy of the palp; capitulum 131μm (128μm-148μm) in length; figure 74 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the segments of the first leg: I-Leg-1, 52μ m (42μ m-48μm); I-Leg-2, 48μ m (42μ m-48μm); I-Leg-3, 38μ m (35μ m-44μm); I-Leg-4, 58μ m (62μ m- 72μ m); I-Leg-5, 86μ m (83μ m- 93μ m); I-Leg-6, 90μ m (90μ m- 97μ m); figure 72 illustrates these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 118μ m (111μ m- 125μ m); IV-Leg-5, 155μ m (141μ m- 163μ m); IV-Leg-6, 137μ m (133μ m- 148μ m); setae at tip of IV-Leg-6, 87μ m (83μ m- 104μ m) in length; 10-11 swimming hairs on IV-Leg-5; figure 75 shows

IV-Leg-5 and 6.

Holotype: Adult \(\foats, \) from Pohue Stream at Waiomu (Coromandel Peninsula), Oct. \(\frac{26}{1982} \).

Allotype: Adult of, same data as holotype.

Paratypes: NORTH ISLAND: 7 9, from Waikohatu Stream on Rt. 12 (in Kauri Forest), May 29, 1981; 1 of, from Otupoto Stream on Rt. 32, between Hingarae Rd. and Waihaha Rd. (west of Taupo), June 6, 1981; 4 ♀, from Mangakowiriwiri Stream on Rt. 32, at Kakako Rd. turnoff (northwest of Lake Taupo), June 6, 1981; 2 9, Waikohatu Stream on Rt. 12 (in Waipoua State Forest), Oct. 24, 1982; 1 ♂, 4 ♀, same data as holotype; 1 ♂, from Orauhora Stream on Rt. 30, between Barryville and Benneydale, Oct. 31, 1982; 2 ♂, 8 ♀, Waitaanga Stream near town of same name, on Rt. 40 west of Ohura, Oct. 31, 1982; 3 ♂, 3 ♀, from Mangamawhete Stream on Rt. 3, between Inglewood and Stratford (Egmont area), Nov. 1, 1982; 6 ♂, 10 ♀, from a stream on Rt. 6, just north of Makatote viaduct between Raetiki and National Park, Nov. 2, 1982; 3 of, 3 of, Makakomiko Stream on Rt. 4 (1 km south of Erua), between Erua and National Park, Nov. 2, 1982; 2 of, 5 ♀, from stream on Rt. 32, at Kakao Rd. turnoff (northwest of Taupo), Nov. 3, 1982; 8 of, 2 ♀, Otupoto Stream on Rt. 32, west of Lake Taupo, Nov. 3, 1982; SOUTH ISLAND: 1 ♂, 1♀, Opouri River between Carluke and Opouri Valley on Tennyson Inlet Rd., Nov. 6, 1982; 1 \, Potters Creek on Rt. 6, between Bruce Bay and Lake Paringa (north of Haast), Nov. 10, 1982; 20, 6 ♀, Catlin River on Morris Saddle Rd. (in Catlin State Forest area) between Lawanui and Owaka, Nov. 12, 1982; 4 of, 4 ♀, from a tributary of the Tahakopa River on Tahakopa Rd., 5.5 km from Waikawa Valley Rd., Nov. 12, 1982; 2 of, 4 \, Pourakino River at Pourakino Picnic Grounds (in Longwood State Forest), on Harrington Rd. south of Otautau, Nov. 13, 1982; 4, from Boyd Creek on Rt. 94, 76 km south of Milford Sound, Nov. 14, 1982; 7 of, 3 \(\gamma\), from the Hope River on Rt. 6, between Glenhope and Kawatiri, Nov. 25, 1982.

Discussion: The present species resembles F. lacustris in most characteristics but differs as follows: The distal segments of the first leg, fourth leg and P-IV are proportionally longer in lacustris. F. lacustris is also a much more deeply pigmented species and lives in lakes rather than streams.

12. Flabellifrontipoda zelandica Hopkins

(Figs. 78-80, 82-85)

Flabellifrontipoda zelandica Hopkins, 1975. Jour. Royal Soc. New Zealand, 5: 9.

Female: Length of body $790\mu\text{m}-835\mu\text{m}$; height of body $540\mu\text{m}-608\mu\text{m}$; coxae greatly expanded and occupying all of body except for a median unsclerotized strip extending from anterior end of dorsum to the genital field; unsclerotized strip with paired postocularia platelets, four narrow median sclerites and three pairs of lyrifissures (fig. 83); posterior two-thirds of coxal area bearing 10 pairs of glandularia, one pair of these (fig. 82, arrow) extending anteriorly more or less in line with middle of genital field; body noticeably tapering posteriorly when viewed laterally; genital flaps $182\mu\text{m}-197\mu\text{m}$ in length; three pairs of genital acetabula, these elongated and placed close together on their respective sides; excretory pore on a small sclerite immediately posterior to the genital field; median ventral suture line well developed; dorsal lengths of the palpal segments; P-I, $34\mu\text{m}-38\mu\text{m}$; P-II, $41\mu\text{m}-44\mu\text{m}$; P-III, $39\mu\text{m}-41\mu\text{m}$; P-IV, $65\mu\text{m}-66\mu\text{m}$; P-V, $18\mu\text{m}-20\mu\text{m}$; figure 80 shows the proportions and chaetotaxy of the palp;

capitulum $162\mu\text{m}$ — $169\mu\text{m}$ in length; figure 78 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the segments of the first leg: I-Leg-1, $55\mu\text{m}$ – $58\mu\text{m}$; I-Leg-2, $48\mu\text{m}$; I-Leg-3, $52\mu\text{m}$ – $55\mu\text{m}$; I-Leg-4, $76\mu\text{m}$ – $83\mu\text{m}$; I-Leg-5, $98\mu\text{m}$ – $104\mu\text{m}$; I-Leg-6, $100\mu\text{m}$ – $106\mu\text{m}$; claws with numerous clawlets; figure 79 shows the first leg; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $111\mu\text{m}$ – $118\mu\text{m}$; IV-Leg-5, $140\mu\text{m}$ – $141\mu\text{m}$; IV-Leg-6, $111\mu\text{m}$ – $118\mu\text{m}$; two elongated setae at tip of IV-Leg-6, these $152\mu\text{m}$ – $176\mu\text{m}$ in length; IV-Leg-5 with seven swimming hairs.

Male: Similar to female but slightly smaller and genital field proportionally shorter; length of body 760 μ m; height of body 554 μ m; genital flaps 152 μ m in length; dorsal lengths of the palpal segments: P-I, 38 μ m; P-II, 41 μ m; P-III, 41 μ m; P-IV, 66 μ m; P-V, 19 μ m; capitulum 166 μ m in length; dorsal lengths of the segments of the first leg: I-Leg-1, 55 μ m; I-Leg-2, 45 μ m; I-Leg-3, 54 μ m; I-Leg-4, 76 μ m; I-Leg-5, 90 μ m; I-Leg-6, 103 μ m; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 110 μ m; IV-Leg-5, 133 μ m; IV-Leg-6, 103 μ m; two long setae at tip of IV-Leg-6, these approximately 173 μ m in length; IV-Leg-5 with six swimming hairs.

Discussion: The anterior shifting of one of the lower coxal glandularia (fig. 82, arrow) is diagnostic.

13. Flabellifrontipoda ladilofa, new species

(Figs. 86-91, 93)

Male: Length of body $623\mu m$ ($669\mu m$ - $684\mu m$); height of body $395\mu m$ ($456\mu m$); coxae greatly expanded and occupying all of body except for a median unsclerotized strip extending from anterior end of dorsum to genital field; unsclerotized strip with paired postocularia platelets, three narrow median sclerites and with three pairs of lyrifissures (fig. 86); posterior two-thirds of coxal area bearing 10 pairs of glandularia; body gradually tapering posteriorly when viewed laterally (fig. 90); genital flaps $106\mu m$ (lll μm) in length; three pairs of genital acetabula, these elongated and placed very close together on their respective sides; excretory pore on a small sclerite immediately posterior to the genital field; median ventral suture line well developed; dorsal lengths of the palpal segments: P-I, $17\mu \text{m}$ ($16\mu \text{m}$ - $20\mu \text{m}$); P-II, $34\mu \text{m}$ ($35\mu \text{m}$ - $37\mu \text{m}$); P-III, $38\mu \text{m}$ ($31\mu \text{m}$ - $35\mu \text{m}$); P-IV, $13\mu m$ ($13\mu m$ - $14\mu m$); P-V, $8\mu m$ ($7\mu m$); figure 91 shows the proportions and chaetotaxy of the palp; capitulum $138\mu m$ ($141\mu m$ - $145\mu m$) in length; chelicera $104\mu m$ ($114\mu m$); in length; figure 93 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the segments of the first leg: I-Leg-1, $35\mu m$ $(38\mu \text{m}-40\mu \text{m})$; I-Leg-2, $38\mu \text{m}$ $(38\mu \text{m}-40\mu \text{m})$; I-Leg-3, $28\mu \text{m}$ $(27\mu \text{m}-29\mu \text{m})$; I-Leg-4, $46\mu m$ ($46\mu m$ - $48\mu m$); I-Leg-5, $66\mu m$ ($69\mu m$ - $76\mu m$); I-Leg-6, $76\mu m$ $(79\mu m-83\mu m)$; claws with numerous clawlets; figure 88 shows the proportions and chaetotaxy of the first leg; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $100\mu m$ ($104\mu m$ - $107\mu m$); IV-Leg-5, $118\mu m$ ($131\mu m$); IV-Leg-6, $97\mu \text{m}$ ($107\mu \text{m}$ - $110\mu \text{m}$); two elongated setae at tip of IV-Leg-6, these $104\mu \text{m}$ - $124\mu m$ in length; IV-Leg-5 with seven swimming hairs.

Female: Similar to male but averaging somewhat larger and the genital flaps are proportionally longer; length of body $738\mu m$; height of body $502\mu m$;

genital flaps $170\mu m$ in length; dorsal lengths of the palpal segments: P-I, $21\mu m$; P-II, $36\mu m$; P-III, $36\mu m$; P-IV, $14\mu m$; P-V, $9\mu m$; capitulum $155\mu m$ in length; chelicera $110\mu m$ in length; dorsal lengths of the segments of the first leg: I-Leg-1, $44\mu m$; I-Leg-2, $41\mu m$; I-Leg-3, $27\mu m$; I-Leg-4, $48\mu m$; I-Leg-5, $76\mu m$; I-Leg-6, $83\mu m$; dorsal lengths of distal segments of fourth leg: IV-Leg-4, $111\mu m$; IV-Leg-5, $124\mu m$; IV-Leg-6, $107\mu m$; setae at tip of IV-Leg-6 broken; IV-Leg-5 with six swimming hairs.

Holotype: Adult of, from Waikohatu Stream on Rt. 12 (in Waipoua State For-

est), North Island, Oct. 24, 1982.

Allotype: Adult \mathcal{P} , from a stream on Rt. 6, just north of Makatote Viaduct between Raetiki and National Park, North Island, Nov. 2, 1982.

Paratypes: 2 of, from Orauhora Stream on Rt. 30, between Barryville and

Benneydale, North Island, June 6, 1981.

Discussion: This is the first of three species in which there has been a very great reduction in P-IV and P-V, and P-III has taken over the usual function of P-IV. The level of reduction of size of P-IV and P-V forms a transformation series (figs. 96, 19, 94) with P-IV and P-V actually fused in the last species. Based on structure of the palp, the present species is closest to the following species, F. crameri (compare figures 91 and 96). See remarks under the latter for characteristics which will separate the two.

14. Flabellifrontipoda crameri, new species

(Fig. 96)

Male: Length of body $601\mu m$ ($653\mu m$); height of body $479\mu m$ ($486\mu m$); coxae greatly expanded and occupying all of body except for a median unsclerotized strip extending from anterior end of dorsum to the genital field; unsclerotized strip with paired postocularia platelets, three narrow median sclerites and three pairs of lyrifissures; posterior two-thirds of coxal area bearing 10 pairs of glandularia; shape of body in lateral view as shown for the related species (fig. 95); genital flaps $104\mu m$ (lll μm) in length; three pairs of genital acetabula, these elongated and placed very close together on their respective sides; excretory pore on a small sclerite immediately posterior to the genital field; median ventral suture line well developed; dorsal lengths of the palpal segments: P-I, $24\mu m$ $(26\mu m)$; P-II, $35\mu m$ $(36\mu m)$; P-III, $27\mu m$ $(26\mu m)$; P-IV, $16\mu m$ $(18\mu m)$; P-V, 8 μ m; figure 96 shows the proportions and chaetotaxy of the palp; capitulum 156 μ m $(159\mu m)$ in length; chelicera $128\mu m$ ($114\mu m$) in length; capitulum and chelicera similar to that shown in figure 93; dorsal lengths of the segments of the first leg: I-Leg-1, $45\mu m$ ($48\mu m$); I-Leg-2, $44\mu m$ ($41\mu m$); I-Leg-3, $33\mu m$ ($31\mu m$); I-Leg-4, $55\mu \text{m}$ ($55\mu \text{m}$); I-Leg-5, $85\mu \text{m}$ ($83\mu \text{m}$); I-Leg-6, $86\mu \text{m}$ ($81\mu \text{m}$); claws with numerous clawlets; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $90\mu \text{m}$ (100 μm); IV-Leg-5, 124 μm (131 μm); IV-Leg-6, 121 μm (117 μm); two elongated setae at tip of IV-Leg-6, these 104μ m- 107μ m in length; IV-Leg-5 with 17-18 swimming hairs.

<u>Female</u>: Similar to male but genital flaps are proportionally longer; length of body 632μ m; height of body 502μ m; genital flaps 177μ m in length; dorsal lengths of the palpal segments: P-I, 25μ m; P-II, 35μ m; P-III, 28μ m; P-IV, 17μ m; P-V, 9μ m; capitulum 152μ m in length; chelicera 121μ m in length; dorsal lengths of the segments of the first leg: I-Leg-1, 41μ m; I-Leg-2, 38μ m; I-Leg-3, 27μ m; I-Leg-4, 52μ m; I-Leg-5, 79μ m; I-Leg-6, 86μ m; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 100μ m; IV-Leg-5, 134μ m;

IV-Leg-6, $111\mu m$; longest seta at tip of IV-Leg-6, $121\mu m$ in length; IV-Leg-5 with 17 swimming hairs.

Holotype: Adult of, from Waikohatu Stream on Rt. 12 (in Kauri Forest), North Island, May 29, 1981.

Allotype: Adult \(\begin{aligned} \text{, same data as holotype} \).

Paratype: 1 of, from Boom Stream on Rt. 25, between Hakaai and Whangamata, North Island, Oct. 27, 1982.

<u>Discussion</u>: As mentioned under the preceding species, *ladilofa* and *crameri* seem closely related. *F. crameri* has a high body similar to that shown in figure 95 (compare this with the lateral view of the previous species—figure 90). IV-Leg-5 bears 17-18 swimming hairs in the present species, only six or seven in the previous species. There are also distinct palpal differences (compare figures 91 and 96).

15. Flabellifrontipoda reductipalpa, new species

(Figs. 92, 94, 95, 97, 98, 100)

Female: Length of body $684\mu m$ ($669\mu m-744\mu m$); height of body $514\mu m$ (514 μ m- 562μ m); coxae greatly expanded and occupying all of body except for a medial unsclerotized strip extending from anterior end of dorsum to genital field; unsclerotized strip with paired postocularia platelets, three narrow median sclerites and three pairs of lyrifissures; posterior two-thirds of coxal area with 10 pairs of glandularia (fig. 95); genital flaps $157\mu m$ ($155\mu m-177\mu m$) in length; three pairs of genital acetabula, these elongated and placed close together on their respecitive sides; excretory pore on a small sclerite immediately posterior to the genital field; median ventral suture line well developed; dorsal lengths of the palpal segments: P-I, $19\mu m$ ($20\mu m-22\mu m$); P-II, $52\mu m$ ($51\mu m-54\mu m$); P-III, $40\mu \text{m}$ (37 μm -39 μm); fused P-IV and P-V, 19 μm (18 μm -21 μm); P-III much less high than in the previous two species and P-IV and P-V have actually fused (although area of fusion is discernible); figure 94 illustrates the proportions and chaetotaxy of the palp; capitulum $152\mu m$ ($159\mu m$ - $162\mu m$) in length; chelicera $114\mu m$ ($114\mu m$ - $121\mu m$) in length; figure 92 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the segments of the first leg: I-Leg-1, 42 μ m (44 μ m-48 μ m); I-Leg-2, 44 μ m (42 μ m-44 μ m); I-Leg-3, 27 μ m (24 μ m-29 μ m); I-Leg-4, $51\mu m$ ($45\mu m$ - $52\mu m$); I-Leg-5, $73\mu m$ ($76\mu m$ - $79\mu m$); I-Leg-6, $83\mu m$ $(83\mu \text{m}-87\mu \text{m})$; claws with numerous clawlets; I-Leg-3 with two medial setae greatly thickened; figure 97 shows the structure of the first leg; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $114\mu m$ ($114\mu m$ - $119\mu m$); IV-Leg-5, $145\mu m$ ($142\mu m$ - $155\mu m$); IV-Leg-6, $121\mu m$ ($121\mu m$ - $126\mu m$); two elongated setae at tip of IV-Leg-6, these 128µm-138µm in length; IV-Leg-5 with 11-13 swimming hairs.

Male: Similar to female but averaging somewhat smaller and genital field proportionally shorter; length of body 654μm (593μm-662μm); height of body 471μm (426μm-502μm); genital flaps 106μ m (98μm- 106μ m) in length; dorsal lengths of the palpal segments: P-I, 20μ m (20μ m- 21μ m); P-II, 49μ m (47μ m- 51μ m); P-III, 36μ m (34μ m- 35μ m); fused P-IV and P-V, 18μ m (17μ m- 20μ m); capitulum 149μ m (145μ m- 155μ m) in length; chelicera 107μ m (104μ m- 114μ m) in length; dorsal lengths of the segments of the first leg: I-Leg-1, 45μ m (46μ m- 48μ m); I-Leg-2, 43μ m (41μ m- 45μ m); I-Leg-3, 26μ m (26μ m- 28μ m); I-Leg-4, 48μ m (46μ m- 52μ m); I-Leg-5, 76μ m (69μ m- 75μ m); I-Leg-6, 85μ m (83μ m- 87μ m); dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 107μ m

 $(96\mu\text{m}-104\mu\text{m})$; IV-Leg-5, $141\mu\text{m}$ $(121\mu\text{m}-132\mu\text{m})$; IV-Leg-6, $114\mu\text{m}$ $(114\mu\text{m}-121\mu\text{m})$; two elongated setae at tip of IV-Leg-6, these $104\mu\text{m}-128\mu\text{m}$ in length; IV-Leg-5 with 10-12 swimming hairs.

Holotype: Adult 9, from a stream on Rt. 12 at Kaihu (Northland), North Is-

land, May 29, 1981.

Allotype: Adult of, same data as holotype.

Paratypes: NORTH ISLAND: 4 of, 3 of, same data as holotype; I of, collected in Waikohatu Stream on Rt. 12 (in Kauri Forest), May 29, 1981; 1 of, 1 of, from Pohue Stream at Waiomu (Coromandel Peninsula), Oct. 26, 1982; 1 of, from the Tapu River, I km east of Tapu (Coromandel Peninsula) Oct. 27, 1982; 1 of, 1 of, from a tributary of Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), Oct. 27, 1982; 1 of, Orauhora Stream on Rt. 30, between Barryville and Bennydale, Oct. 31, 1982; 3 of, 4 of, from Waitaanga Stream near town of same name, on Rt. 40 west of Ohura, Oct. 31, 1982; 1 of, Otupoto Stream on Rt. 32, west of Lake Taupo, Nov. 3, 1982; SOUTH ISLAND: 1 of, from the Hope River on Rt. 6, between Glenhope and Kawatiri, Nov. 25, 1982.

Discussion: The morphology of the palp, with P-IV and P-V actually fused,

and P-III much longer than high, is diagnostic for the present species.

Genus OXUS Kramer

16. Oxus sp.

(Figs. 99, 101-103)

Nymph: Body $471\mu m$ in length, $243\mu m$ in width; dorsum unsclerotized; coxal area with a median unsclerotized strip (fig. 99); provisional genital field $41\mu m$ in length, $38\mu m$ in width; dorsal lengths of the palpal segments: P-I, 21μ ; P-II, $24\mu m$; P-III, $23\mu m$; P-IV, $38\mu m$; P-V, $13\mu m$; figure 102 illustrates the proportions and chaetotaxy of the palp; capitulum $90\mu m$ in length; chelicera $79\mu m$ in length; dorsal lengths of the segments of the first leg: I-Leg-1, $38\mu m$; I-Leg-2, $28\mu m$; I-Leg-3, $28\mu m$; I-Leg-4, $45\mu m$; I-Leg-5, $52\mu m$; I-Leg-6, $60\mu m$; figure 101 shows the first leg; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $59\mu m$; IV-Leg-5, $79\mu m$; IV-Leg-6, $86\mu m$; elongated seta at tip of IV-Leg-6, $101\mu m$ in length; IV-Leg-5 with seven or eight swimming hairs.

Material Examined: 1 nymph, from a tributary of the Waiwawa River at the AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), Oct. 27, 1982.

Discussion: As it is difficult to assign a species name to a nymphal oxid, the present specimen is unnamed and it is included mainly for later comparison with Australian species of the genus. It was initially thought that only Flabellifrontipoda, a strictly austral group, occurred in New Zealand and, of 600 specimens of Oxidae found (including nymphs), a single nymph of Oxus was taken. It is possible that adults of this species occur only at other seasons of the year althouth, based on life histories of this genus in other parts of the world, this seems very unlikely. It is also possible that the species normally inhabits an entirely different habitat, possibly a lake or pond, and its occurance in a stream was an accident. However, natural lentic situations apparently do not occur on the Coromandel Peninsula. A third possibility is that the mite may have arrived on its insect host from Australia. The apparent lack of species shared by New Zealand and Australia attests to the rarity with which species from one area are actually able to establish in the other. However, it seems probable that, from time to time, water mites as parasites of winged aquatic insects do survive the

trip between the two regions. However, it is very unlikely that these mites, few in number and probably widely scattered, are able to reproduce or compete with the established fauna. Both would be necessary in order to actually establish a permanent population. Once the nymphal material from my Australian collections have been put on slides, it will be possible to compare the New Zealand specimen to see if it is conspecific with one of the Australian Oxus. If so, this likely represents an isolated case of dispersion.

Family LIMNESIIDAE Thor

Genus LIMNESIA Koch

KEY TO THE NEW ZEALAND SPECIES OF LIMNESIA

1.	Dorsal and ventral shields absent
2.	Glandula Limnesiae near anterior margin of third coxae (fig. 104); ventral side of P-IV with numerous small setal tubercles (figs. 105, 106)
3.	Nine pairs of dorsal glandularia, these either on the dorsal shield or in the dorsal furrow; body deeply pigmented
4.	Dorsal shield with six pairs of glandularia (fig. 120) L. zelandica, new species
5.	The following five species can be distinguished by the number of dorsal glandularia pairs incorporated into the dorsal shield and are not presented dichotomously.
	A. Three pairs of glandularia on dorsal shield (fig. 130)
	L. auspexa, new species(p. 23) B. Four pairs of glandularia on dorsal shield (fig. 140)
	L. birgelda, new species (p. 24)
	C. Six pairs of glandularia on dorsal shield (fig. 146) L. testacea Hopkins(p. 25)
	D. Seven pairs of glandularia on dorsal shield (fig. 150)
	L. halcarda, new species(p. 26) E. Eight pairs of glandularia on dorsal shield (fig. 157)
	L. crowelli, new species (p. 27)

17. Limnesia foldoma, new species

(Figs. 104-110)

Male: Length of body $1150\mu m$ ($1140\mu m$ - $1215\mu m$); dorsum with a posteromedial muscle attachment platelet $125\mu\mathrm{m}$ ($107\mu\mathrm{m}$ - $125\mu\mathrm{m}$) in length, $118\mu\mathrm{m}$ ($89\mu\mathrm{m}$ - $104 \mu m$) in width; length between anterior end of first coxae and posterior end of genital field $744\mu m$ ($714\mu m-805\mu m$); first coxae separated medially but close together for a relatively long distance; posterior apodemes of anterior coxal groups short; Glandula Limnesiae shifted to a spot close to anterior margin of third coxae; epimeroglandularia l free; genital field $273\mu m$ ($244\mu m-259\mu m$) in length, $310\mu m$ ($293\mu m$ - $326\mu m$) in width; three pairs of genital acetabula, these relatively large and occupying much of the area of the genital field; only a few setae present on genital flaps; figure 104 illustrates the ventral sclerites; dorsal lengths of the palpal segments: P-I, $34\mu m$ ($30\mu m-34\mu m$); P-II, $152\mu m$ (155 μ m-178 μ m); P-III, 96 μ m (96 μ m-111 μ m); P-IV, 174 μ m (167 μ m-181 μ m); P-V, $68\mu m$ ($63\mu m$ - $74\mu m$); ventral side of P-II bulging and with a short, peg-like seta; P-IV with two rows of small setal tubercles giving the distal portion of ventral side a serrate appearance (fig. 106); capitulum $236\mu m$ ($222\mu m-258\mu m$) in length; chelicera $407\mu m$ ($392\mu m-444\mu m$) in length; figure 107 illustrates a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $199\mu m$ ($189\mu m$ -200 μm); I-Leg-5, $248\mu m$ ($229\mu m$ - $244\mu m$); I-Leg-6, $219\mu m$ ($204\mu m$ - $222\mu m$); dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $318\mu m$ ($303\mu m$ - $370\mu m$); IV-Leg-5, $340\mu m$ ($311\mu m$ - $326\mu m$); IV-Leg-6, $318\mu m$ ($288\mu m$ - $303\mu m$); IV-Leg-5 with ll-15 swimming hairs; IV-Leg-6 with six or seven swimming hairs; subterminal seta on IV-Leg-6 relatively short.

Female: Similar to male except in structure of palp and genital field; length of body $1290\mu m$ ($1210\mu m$ - $1520\mu m$); posteromedial platelet of dorsum $137\mu m$ (III μ m-148 μ m) in length, 125 μ m (104 μ m-118 μ m) in width; length between tips of anterior coxae and posterior end of genital field $760\mu m$ ($684\mu m-850\mu m$); genital field $303\mu m$ ($274\mu m-333\mu m$) in length, $214\mu m$ ($214\mu m-236\mu m$) in width; three pairs of genital acetabula, these occupying most of the area of the genital flaps (fig. 109); dorsal lengths of the palpal segments: P-I, $37\mu m$ ($30\mu m-37\mu m$); P-II, $167\mu \text{m} (155\mu \text{m}-185\mu \text{m}); \text{ P-III}, 115\mu \text{m} (104\mu \text{m}-126\mu \text{m}); \text{ P-IV}, 185\mu \text{m} (177\mu \text{m}-214)$ μ m); P-V, 85 μ m (71 μ m-89 μ m); P-IV proportionally longer and with fewer ventral setal tubercles than in male (fig. 105); capitulum $251\mu\mathrm{m}$ ($237\mu\mathrm{m}$ - $281\mu\mathrm{m}$) in length; chelicera $458\mu m$ ($444\mu m$ - $518\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $200\mu m$ ($192\mu m$ - $236\mu m$); I-Leg-5, $256\mu m$ $(236\mu \text{m}-281\mu \text{m})$; I-Leg-6, $229\mu \text{m}$ $(214\mu \text{m}-252\mu \text{m})$; figure 108 shows I-Leg-5 and 6; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 330µm $(296\mu \text{m}-392\mu \text{m})$; IV-Leg-5, $355\mu \text{m}$ $(311\mu \text{m}-407\mu \text{m})$; IV-Leg-6, $311\mu \text{m}$ $(281\mu \text{m}-407\mu \text{m})$ 355μm); IV-Leg-5 with 12-17 swimming hairs; IV-Leg-6 with seven or eight swimming hairs; figure 110 shows IV-Leg-5 and 6.

Holotype: Adult of, from the Haparapara River, 4 km north of Omaio (East Cape District), North Island, Oct. 28, 1982.

All I All I O Diana, Oct. 20, 1002.

Allotype: Adult \(\begin{aligned} \text{, same data as holotype.} \end{aligned} \)

Paratypes: 9 of, 6 \, same data as holotype; 2 of, 4 \, from the Hope River on Rt. 6, between Glenhope and Kawatiri, South Island, Nov. 25, 1982.

Discussion: The combination of numerous small setal tubercles on P-IV, anterior shifting of the Glandula Limnesiae and presence of swimming hairs on IV-Leg-6 will easily separate the present species from all other known members of the genus.

18. Limnesia reptans Hopkins

(Figs. 111-116)

Limnesia reptans Hopkins, 1966. Trans. Royal Soc. New Zealand, 8:1.

Male: Length of body $638\mu m$; dorsum with a posteromedial muscle attachment platelet $170\mu m$ in length, $89\mu m$ in width; postocularia on sclerites which are approximately double the size of the glandularia bases (fig. 115); length between anterior end of first coxae and posterior end of genital field $479\mu m$; first coxae separated medially but close together; posterior apodemes of anterior coxal group short; Glandula Limnesiae in a line with the medial setae of third coxae; epimeroglandularia I fused with second coxae; genital field 192 \mu in length, 188µm in width; three pairs of genital acetabula, these relatively small and occupying only a small portion of the surface of the genital field; numerous peripheral setae present lateral to the acetabula; figure 116 illustrates the ventral sclerites; dorsal lengths of the palpal segments: P-I, $33\mu m$; P-II, $126\mu m$; P-III, $89\mu m$; P-IV, $148\mu m$; P-V, $52\mu m$; peg-like seta on ventral side of P-II short and pointed; figure 112 shows the proportions and chaetotaxy of the palp; capitulum $170\mu m$ in length; chelicera $281\mu m$ in length; figure 111 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 111μ m; I-Leg-5, 137μ m; I-Leg-6, 148μ m; figure 114 shows I-Leg-5 and 6; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $155\mu m$; IV-Leg-5, $189\mu m$; IV-Leg-6, $185\mu m$; seta at tip of IV-Leg-6, $126\mu m$ in length; no swimming hairs present.

Female: See Hopkins (1966a).

Material Examined: This species is an inhabitant of helocrene spring seeps and was not recollected. This specimen, taken by Ceri Hopkins from the type locality (spring in valley of Mangakotukutuku River, near Paraparaumu) is here only included for the sake of completeness. Presently, only two species of Limnesia lacking dorsal and ventral shields are known from New Zealand, and are so distinct from each other that the characters given in the key are easily sufficient to distinguish the two.

19. Limnesia zelandica, new species

(Figs. 117-120, 122, 126)

<u>Male</u>: Dorsal and ventral shields present; dorsal shield $456\mu m$ in length, $330\mu m$ in width; dorsal shield bearing six pairs of glandularia and is flanked by three pairs of glandularia in the dorsal furrow; eye lenses relatively large, eye pigment present; integument pigmented; ventral shield $547\mu m$ in length, $410\mu m$ in width; capitular bay U-shaped and with a median cleft; Glandula Limnesiae located close to suture line between third and fourth coxae; a well developed ridge on each side extending anteriorly from openings for insertion of the fourth legs; genital field area $99\mu m$ in length, $118\mu m$ in width; three pairs of genital acetabula; gonopore $63\mu m$ in length; excretory pore and a pair of glandularia fused with ventral shield; figure 118 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $17\mu m$; P-II, $66\mu m$; P-III, $52\mu m$; P-IV, $86\mu m$; P-V, $40\mu m$; structure of palp as described and illustrated for the female; capitulum $192\mu m$ in length; chelicera $207\mu m$ in length; capitulum elongated and without posterodorsal projections; capitulum attached to a tube of soft

integument to form protrusible mouthparts; figure 119 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $80\mu m$; I-Leg-5, $96\mu m$; I-Leg-6, $112\mu m$; figure 122 shows I-Leg-5 and 6; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $91\mu m$; IV-Leg-5, $107\mu m$; IV-Leg-6, $109\mu m$; seta at tip of IV-Leg-6, $66\mu m$ in length; structure of IV-Leg-5 and 6 similar to that of the related species (fig.

123); swimming hairs absent.

Female: Similar to male except for genital field region; dorsal shield 509 μm (479μm-547μm) in length, 399μm (380μm-406μm) in width; dorsal shield as described for male (fig. 120); ventral shield 623μm (608μm-658μm) in length, 510μm (479μm-517μm) in width; genital field 148μm (141μm-155μm) in length, 137μm (136μm-148μm) in width; dorsal lengths of the palpal segments: P-I, 17μm (17μm-21μm); P-II, 71μm (76μm-78μm); P-III, 52μm (48μm-52μm); P-IV, 92 μm (93μm-100μm); P-V, 41μm (40μm-42μm); a short, pointed peg-like seta on ventral side of P-II, figure 126 illustrates the palp; capitulum 214μm (214μm-229μm) in length; chelicera 237μm (229μm-258μm) in length; capitulum protrusible as described for male; dorsal lengths of the distal segments of the first leg: I-Leg-4, 83μm (83μm-87μm); I-Leg-5, 97μm (97μm-100μm); I-Leg-6, 111μm (110μm-117μm); dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 104μm (106μm-114μm); IV-Leg-5, 110μm (114μm-121μm); IV-Leg-6, 121μm (123μm-128μm); seta at tip of IV-Leg-6, 76μm (59μm-85μm) in length; swimming hairs absent.

Holotype: Adult of, from the Hope River on Route 6, between Glenhope and

Kawatiri, South Island, Nov. 25, 1982.

Allotype: Adult \(\bar{2} \), same data as holotype.

Paratypes: 3 \(\), same data as holotype; 1 \(\), from a tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), North Island, Oct. 27, 1982; 1 \(\), Kaituna River on Rt. 6, 5 km south of Havelock, South Island, Nov. 22, 1982.

Discussion: The present species is most closely related to the following species. They both are deeply pigmented and have well developed eyes and lenses. The capitulum is very long and without posterodorsal projections in both species and is attached to a tube of soft integument to form protrusible mouthparts. In addition, they have a total of nine pairs of dorsal glandularia, either incorporated into the dorsal shield or in the dorsal furrow (and only one pair of glandularia fused with the posterior portion of the ventral shield). See remarks under the following species for characters which will separate the two.

20. Limnesia conroyi, new species

(Figs. 121, 123, 125, 127, 128)

<u>Male</u>: Dorsal and ventral shields present; dorsal shield $517\mu m$ ($532\mu m$) in length, $395\mu m$ ($380\mu m$) in width; dorsal shield bearing five pairs of glandularia and is flanked by four additional pairs of glandularia in the dorsal furrow (fig. 128); eye lenses relatevely large, eye pigment present; integument deeply pigmented; ventral shield $589\mu m$ ($601\mu m$) in length, $471\mu m$ ($456\mu m$) in width; capitular bay U-shaped and with a median cleft; Glandula Limnesiae located close to the suture line between third and fourth coxae; a well developed ridge on each side extending anteriorly from insertions of fourth legs; genital field area $100\mu m$ ($102\mu m$) in length, $122\mu m$ ($126\mu m$) in width; three pairs of genital acetabula; gonopore $78\mu m$ ($81\mu m$) in length; excretory pore and one pair of glandularia are

incorporated into the posterior end of ventral shield; figure 127 illustrates the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $19\mu m$ ($18\mu m$); P-II, $69\mu m$ ($74\mu m$); P-III, $54\mu m$ ($55\mu m$); P-IV, $93\mu m$ ($96\mu m$); P-V, $36\mu m$ ($38\mu m$); figure 125 illustrates the proportions and chaetotaxy of the palp; capitulum $207\mu m$ ($214\mu m$) in length; chelicera $229\mu m$ ($246\mu m$); in length; capitulum elongated and without posterodorsal projections; capitulum attached to a tube of soft integument to form protrusible mouthparts; structure of capitulum as shown for the related species (fig. 119); dorsal lengths of the distal segments of the first leg: I-Leg-4, $74\mu m$ ($76\mu m$); I-Leg-5, $90\mu m$ ($90\mu m$); I-Leg-6, $107\mu m$ ($107\mu m$); figure 121 shows I-Leg-5 and 6; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $90\mu m$ ($92\mu m$); IV-Leg-5, $102\mu m$ ($104\mu m$); IV-Leg-6, $110\mu m$ ($111\mu m$); seta at tip of IV-Leg-6, $55\mu m$ in length; figure 123 illustrates IV-Leg-5 and 6; swimming hairs absent.

Female: Unknown.

Holotype: Adult of, from Waikohatu Stream on Rt. 12 (in Kauri Forest), North Island, May 29, 1981.

Paratype: 1 o, same data as holotype.

Discussion: The present species is closely related to the preceding, L. ze-landica, but differs in having only five pairs of glandularia (instead of six) on the dorsal shield, and the male possesses a proportionally much larger gonopore (compare figures 127, 118).

21. Limnesia auspexa, new species

(Figs. 124, 129-133)

Female: Dorsal and ventral shields present; dorsal shield 646µm in length, 486µm in width; dorsal shield bearing three pairs of glandularia and flanked by five pairs of glandularia in the dorsal furrow; eye lenses well developed; integument lightly pigmented; ventral shield $638\mu m$ in length, $562\mu m$ in width; capitular bay somewhat V-shaped and with a short median cleft; Glandula Limnesiae placed close to suture line between third and fourth coxae; no ridges extending anteriorly from openings for insertion of fourth legs; genital field $177\mu\mathrm{m}$ in length, 155 µm in width; three pairs of genital acetabula, there placed very close to the periphery; first pair of acetabula well separated from the other two pairs; the individual described here had not yet become completely sclerotized and the excretory pore and two pairs of glandularia shown free in the integument of the venter (fig. 129) without doubt would have been incorporated into the ventral shield in a fully sclerotized specimen; dorsal lengths of the palpal segments: P-I, $26\mu \text{m}$; P-II, $88\mu \text{m}$; P-III, $62\mu \text{m}$; P-IV, $132\mu \text{m}$; P-V, $42\mu \text{m}$; a small peg-like seta on ventral side of P-II; figure 132 shows the proportions and chaetotaxy of the palp; capitulum $148\mu m$ in length; chelicera $222\mu m$ in length; capitulum relatively short and with well developed posterodorsal projections; mouthparts not protrusible; figure 131 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $93\mu m$; I-Leg-5, $110\mu m$; I-Leg-6, $125\mu m$; figure 133 shows I-Leg-5 and 6; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 138 \mu m; IV-Leg-5, 162 \mu m; IV-Leg-6, $159\mu m$; seta at tip of IV-Leg-6, $72\mu m$ in length; figure 124 shows IV-Leg-5 and 6; swimming hairs absent.

Male: Unknown.

Holotype: Newly metamorphosed \mathcal{P} , from the Tapu River, 1 km east of Tapu (Coromandel Peninsula), North Island, Oct. 27, 1982.

Discussion: This is the first of five species with dorsal and ventral shields in which there are a total of eight dorsal glandularia, either incorporated into the dorsal shield or free in the dorsal furrow (and there are two pairs of glandularia typically fused with the posterior portion of the ventral shield). The present species differs from the others in this group in lacking ridges extending anteriorly from the region of insertion of the fourth legs, and the body is more rounded. This species is also typically pigmented and seems to be an inhabitant of superficial waters. The other four species of the group exhibit loss of eye and integumental pigment and are members of the interstitial water assemblage. Specimens collected by Dr. Ceri Hopkins in a "swampy streamlet in the Waikanae River system, Tararua Mountains", North Island, also belong to this species.

22. Limnesia birgelda, new species

(Figs. 134-138, 140, 141)

Male: Dorsal and ventral shields present; dorsal shield 502μm (456μm-479 μ m) in length, 308 μ m (289 μ m-334 μ m) in width; dorsal shield bearing four pairs of glandularia and flanked by four additional pairs in the dorsal furrow (fig. 140); eye lenses reduced, eye pigment absent; integumental pigment absent, ventral shield $585\mu m$ ($540\mu m-569\mu m$) in length, $380\mu m$ ($342\mu m-395\mu m$) in width; capitular bay U-shaped and with a small median cleft; Glandula Limnesiae well medial to suture line between third and fourth coxae; a well developed ridge on each side extending anteriorly from insertions of fourth legs; medial margin of third coxae very long; genital field area $103\mu m$ ($96\mu m$ - $100\mu m$) in length, $126\mu m$ (109 μ m-ll8 μ m) in width; three pairs of genital acetabula, anterior pair close togather medially and well removed form the other pairs; gonopore $66\mu m$ (59 μm - $63\mu m$) in length and placed posteriorly on genital field; excretory pore and two pairs of glandularia incorporated into the posterior portion of the ventral shield; figure 136 shows the structure of the venter; dorsal lengths of the palpal segments: P-I, $21\mu m$ ($19\mu m$ - $20\mu m$); P-II, $69\mu m$ ($67\mu m$ - $71\mu m$); P-III, $60\mu m$ ($54\mu m$ - $57\mu m$); P-IV, $112\mu m$ ($106\mu m$ - $109\mu m$); P-V, $32\mu m$ ($31\mu m$ - $32\mu m$); structure of palp as shown and described for female; capitulum $124\mu m$ ($111\mu m$ - $118\mu m$) in length; chelicera $199\mu m$ ($194\mu m-200\mu m$) in length; capitulum with posterodorsal projections and not protrusible; dorsal lengths of the distal segments of the first leg: I-Leg-4, $78\mu m$ ($70\mu m$ - $73\mu m$); I-Leg-5, $96\mu m$ ($90\mu m$ - $93\mu m$); I-Leg-6, 114 μm (lllμm); dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $87\mu \text{m}$ ($80\mu \text{m} - 83\mu \text{m}$); IV-Leg-5, $107\mu \text{m}$ ($96\mu \text{m} - 104\mu \text{m}$); IV-Leg-6, $114\mu \text{m}$ ($114\mu \text{m} - 114\mu \text{m}$) $117\mu m$); seta at tip of IV-Leg-6, $58\mu m$ ($45\mu m$ - $55\mu m$) in length; swimming hairs absent.

Female: Dorsal and ventral shields present; dorsal shield $558\mu m$ ($502\mu m$ - $532\mu m$) in length, $349\mu m$ ($304\mu m$ - $349\mu m$) in width; dorsal shield as described for male; ventral shield $638\mu m$ ($577\mu m$ - $612\mu m$) in length, $426\mu m$ ($375\mu m$ - $441\mu m$) in width; genital field extending much farther forward between the coxae and thereby greatly shortening the medial margins of the third coxae; otherwise, ventral shield much as described for male; genital field $163\mu m$ ($150\mu m$ - $155\mu m$) in length, $137\mu m$ ($122\mu m$ - $128\mu m$) in width; genital field widest anteriorly; genital acetabula small, anterior pair well separated from posterior two pairs; fig. 138 illustrates the ventral shield; dorsal lengths of the palpal segments: P-I, $21\mu m$ ($20\mu m$); P-II, $76\mu m$ ($72\mu m$ - $76\mu m$); P-III, $65\mu m$ ($55\mu m$ - $59\mu m$); P-IV, $123\mu m$ ($114\mu m$ - $122\mu m$); P-V, $31\mu m$ ($32\mu m$ - $33\mu m$); ventral side of P-II with a short peg-like seta which extends somewhat distally; figure 134 shows the proportions

and chaetotaxy of the palp; capilulum $130\mu m$ ($126\mu m$ - $141\mu m$) in length; chelicera $236\mu m$ ($196\mu m$ - $215\mu m$) in length; figure 141 shows a lateral view of the capitulum, chelicera and palp; capitulum not protrusible; dorsal lengths of the distal segments of the first leg: I-Leg-4, $84\mu m$ ($76\mu m$ - $82\mu m$); I-Leg-5, $102\mu m$ ($93\mu m$ - $97\mu m$); I-Leg-6, $121\mu m$ ($112\mu m$ - $116\mu m$); figure 135 shows I-Leg-5 and 6; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $91\mu m$ ($87\mu m$ - $90\mu m$); IV-Leg-5, $116\mu m$ ($105\mu m$ - $111\mu m$); IV-Leg-6, $128\mu m$ ($121\mu m$ - $124\mu m$); seta at tip of IV-Leg-6, $55\mu m$ ($57\mu m$ - $58\mu m$) in length; figure 137 shows IV-Leg-5 and 6; swimming hairs absent.

Holotype: Adult of, from a tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula) North Island, Oct. 27, 1982.

Allotype: Adult \(\begin{aligned} \text{, same data as holotype.} \end{aligned} \)

Paratypes: 1 of, 2 \(\text{?}, \) same data as holotype; 1 \(\text{?}, \) from Boom Stream on Rt. 25 between Hakaai and Whangamata, North Island, Oct. 27, 1982; 1 of, 1 \(\text{?}, \) from a stream 1 km north of Tohere (east of Opotiki), on Rt. 35, North Island, Oct. 29, 1982.

<u>Discussion:</u> This is the first of four hyporheic species which have completely lost the eye pigment. The present species may be distinguished from all other New Zealand species by the four pairs of glandularia on the dorsal shield. There are also several *Limnesia* species from interstitial waters in Australia which exhibit varying degrees of development of dorsal and ventral shields and which have lost eye pigment. However, the species groups from the two areas are very distinct from each other and likely are the result of independent invasion of the hyporheic habitat.

23. Limnesia testacea Hopkins

(Figs. 139, 142-147)

Limnesia (Duralimnesia) testacea Hopkins, 1969. Trans. Royal Soc. New Zealand, 11: 89.

Male: Dorsal and ventral shields present; dorsal shield $460\mu \text{m} - 524\mu \text{m}$ in length, $291\mu \text{m}-319\mu \text{m}$ in width; dorsal shield bearing six pairs of glandularia and flanked by two additional pairs in the dorsal furrow; eye lenses reduced, eye pigment absent; integumental pigment absent; ventral shield $547\mu m-608\mu m$ in length, $346\mu m-365\mu m$ in width; capitular bay U-shaped and with a median cleft; Glandula Limnesiae located near medial margins of coxae; a well developed ridge on each side extending anteriorly from insertions of fourth legs; medial margins of third coxae relatively short; genital field area $109\mu m$ -lll μm in width; three pairs of genital acetabula, these rather evenly spaced from each other; gonopore $74\mu \text{m}-81\mu \text{m}$ in length and more or less centrally located; excretory pore and two pairs of glandularia fused with the posterior end of ventral shield; figure 144 shows the venter; dorsal lengths of the palpal segments: P-I, $15\mu m$ - $17\mu \text{m}$; P-II, $59\mu \text{m}$ - $63\mu \text{m}$; P-III, $46\mu \text{m}$ - $51\mu \text{m}$; P-IV, $88\mu \text{m}$ - $95\mu \text{m}$; P-V, $31\mu \text{m}$ - $32\mu m$; palp as described and illustrated for female; capitulum $141\mu m$ - $148\mu m$ in length; chelicera $182\mu \text{m}$ - $192\mu \text{m}$ in length; capitulum with moderately developed posterodorsal projections and capitulum slightly, if at all, protrusible; dorsal lengths of the distal segments of the first leg: I-Leg-4, 76μ m- 82μ m: I-Leg-5, $90\mu\text{m}-97\mu\text{m}$; I-Leg-6, $107\mu\text{m}$ -111 μm ; figure 145 shows I-Leg-5 and 6; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 86µm-93µm; IV-Leg-5, $104\mu\text{m}$ - $111\mu\text{m}$; IV-Leg-6, $114\mu\text{m}$ - $116\mu\text{m}$; seta at tip of IV-Leg-6, $62\mu\text{m}$ - $69\mu\text{m}$

in length; swimming hairs absent; figure 143 shows IV-Leg-5 and 6.

Female: Dorsal and ventral shields present; dorsal shield $460\mu\text{m}-532\mu\text{m}$ in length, $289\mu\text{m}-342\mu\text{m}$ in width; dorsal shield as described for male (fig. 146); ventral shield $540\mu\text{m}-623\mu\text{m}$ in length, $349\mu\text{m}-380\mu\text{m}$ in width; ventral shield, with exception of genital field region, very similar to that of male; genital field $118\mu\text{m}-135\mu\text{m}$ in length, $108\mu\text{m}-126\mu\text{m}$ in width; three pairs of genital acetabula, these relatively evenly spaced; genital field widest anteriorly; figure 142 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $17\mu\text{m}-18\mu\text{m}$; P-II, $59\mu\text{m}-63\mu\text{m}$; P-III, $49\mu\text{m}-53\mu\text{m}$; P-IV, $87\mu\text{m}-97\mu\text{m}$; P-V, $31\mu\text{m}-33\mu\text{m}$; figure 147 shows the proportions and chaetotaxy of the palp; capitulum $133\mu\text{m}-155\mu\text{m}$ in length; chelicera $177\mu\text{m}-201\mu\text{m}$ in length; capitulum as described for male (fig. 139); dorsal lengths of the distal segments of the first leg: I-Leg-4, $71\mu\text{m}-82\mu\text{m}$; I-Leg-5, $86\mu\text{m}-92\mu\text{m}$; I-Leg-6, $100\mu\text{m}-111\mu\text{m}$; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $83\mu\text{m}-93\mu\text{m}$; IV-Leg-5, $97\mu\text{m}-110\mu\text{m}$; IV-Leg-6, $104\mu\text{m}-117\mu\text{m}$; seta at tip of IV-Leg-6, $65\mu\text{m}-80\mu\text{m}$ in length; swimming hairs absent.

Material Examined: NORTH ISLAND: 1 of, from a stream at Sandy's Bridge on Rt. 2, between Opotiki and Gisborne, June 3, 1981; 2 o, from a stream 1 km north of Tohere (east of Opotiki on Rt. 35), Oct. 29, 1982; 2 \, from a stream at Owhiritoa Bridge on Rt. 2, in the "Gorge" south of Opotiki, Oct. 29, 1982; 11 of, 6 ♀, from a stream at Opato Bridge Rest Stop, on Rt. 2 south of Opotiki, Oct. 29, 1982; 17 of, 4 \(\phi\), from a stream at Sandy's Bridge on Rt. 2, in "Gorge" south of Opotiki, Oct. 29, 1982; SOUTH ISLAND: 5 9, 1 9, from tributary of the Wakamarina River 7 km southeast of Canvastown (off Rt 6), Nov. 5, 1982; 6 o, 1 ♀, Opouri River between Carluke and Opouri Valley, on Tennyson Inlet Rd, Nov. 6, 1982; 2 of, from Kararoa Creek on Rt. 6, between Barrytown and Nine Mile Village, Nov. 8, 1982; 1 of, from Cole Creek on Rt. 6, between Lake Moeraki and Haast, Nov. 10, 1982; 1 of, from Boyd Creek on Rt. 97, 76 km south of Milford Sound, Nov. 14, 1982; 1, Parawa Creek on Rt. 6, at Parawa Nokomai Station Rd (approx. 30 km south of Lake Wakatipu), Nov. 15, 1982; 26 of, 19 \, 2, from White Rock River, southwest of Timaru, where Cliffs Rd branches off Pareora-Cave Rd, Nov. 18, 1982; 45 \, 34 \, from Rocky Gully Stream on Rt. 8, between Cave and Fairlie (west of Timaru), Nov. 18, 1982; 5 ♂, 4 ♀, Irongate Stream on Rt 1, 24 km north of Kaikoura, Nov. 21, 1982; 1 of, from Kaituna River on Rt 6, 5 km south of Havelock, Nov. 22, 1982; 11 ♂, 4 ♀, from Graham Stream on Rt. 6, 8 km northeast of Whangamoa Saddle, Nov. 23, 1982; 8 ♂, 3 ♀, Whangamoa River on Rt. 6, approx. 5 km northeast of Whangamoa Saddle, Nov. 23, 1982; 1 of, from a tributary of the Waitapu River at Paynes Ford, 3 km south of Takaka, Nov. 24, 1982; 2 of, 4 of, Pariwhakaoho River on Rt. 60, 14 km northwest of Takaka, Nov. 24, 1982.

Discussion: The only other heavily sclerotized *Limnesia* from New Zealand with six pairs of glandularia on the dorsal shield is the heavily pigmented species from superficial waters, *L. zelandica*. The present species has only two (rather than three) pairs of glandularia in the dorsal furrow and has a much shorter and relatively unprotrusible capitulum.

24. Limnesia halcarda, new species

(Figs. 148-151, 153)

Male: Dorsal and ventral shields present; dorsal shield $517\mu m$ ($502\mu m$) in length, $350\mu m$ ($354\mu m$) in width; dorsal shield bearing seven pairs of glandu-

laria and flanked by one pair in the dorsal furrow; eye lenses small, eye pigment absent; integumental pigment absent; figure 150 shows the morphology of the dorsal shield; ventral shield $601\mu m$ ($608\mu m$) in length, $395\mu m$ ($395\mu m$) in width; capitular bay more or less U-shaped and with a median cleft; Glandula Limnesiae located well lateral to the median coxal suture lines; medial margins of third coxae relatively long; a well developed ridge on each side extending anteriorly from region of insertion of fourth legs; genital field area $89\mu m$ ($88\mu m$) in length, $125\mu\mathrm{m}$ ($120\mu\mathrm{m}$) in width; three pairs of genital acetabula, anterior pair relatively close together; gonopore $52\mu m$ ($56\mu m$) in length and placed posteriorly on the genital field; figure 148 illustrates the ventral shield; dorsal lengths of the palpal segments: P-I, $21\mu m$ ($19\mu m$); P-II, $71\mu m$ ($68\mu m$); P-III, $52\mu m$ ($53\mu m$); P-IV, $90\mu m$ ($94\mu m$); P-V, $37\mu m$ ($39\mu m$); figure 153 shows the proportions and chaetotaxy of the palp; capitulum $170\mu m$ ($178\mu m$) in length; chelicera $214\mu m$ (222µm) in length; capitulum somewhat elongated and with small posterodorsal projections as shown for the related species (fig. 156); capitulum somewhat protrusible; dorsal lengths of the distal segments of the first leg: I-Leg-4, $77\mu\mathrm{m}$ $(78\mu m)$; I-Leg-5, $97\mu m$ $(99\mu m)$; I-Leg-6, $131\mu m$ $(131\mu m)$; segments of first leg relatively long and not as stocky as in other species of the group (fig. 151); dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $85\mu m$ ($87\mu m$); IV-Leg-5, $88\mu m$ ($93\mu m$); IV-Leg-6, $96\mu m$ ($95\mu m$); seta at tip of IV-Leg-6, 69 μm (72 μm) in length; figure 149 shows the morphology of IV-Leg-5 and 6; swimming hairs absent.

Female: Unknown.

Holotype: Adult of, from a stream at Omaukoro Bridge on Rt. 2, in the ''Gorge'' south of Opotiki, Oct. 29, 1982.

Paratype: 1 of, same data as holotype.

Discussion: The presence of seven pairs of glandularia on the dorsal shield is diagnostic.

25. Limnesia crowelli, new species

(Figs. 152, 154-159)

Male: Dorsal and ventral shields present; dorsal shield $441\mu m$ (395 μm -441 μ m) in length, 304μ m (284μ m- 312μ m) in width; dorsal shield bearing eight pairs of glandularia; no glandularia lying in the dorsal furrow; eye lenses small; eye pigment absent; integumental pigment absent; ventral shield 502µm (471µm-524 μ m) in length, 350 μ m (326 μ m-342 μ m) in width; capitular bay U-shaped and with a short median cleft; Glandula Limnesiae placed well lateral to median coxal suture lines; medial margins of third coxae relatively long; a well developed ridge on each side extending anteriorly from region of insertion of fourth legs; genital field area $85\mu m$ ($76\mu m-85\mu m$) in length, $118\mu m$ ($111\mu m-118\mu m$) in width; three pairs of genital acetabula; gonopore $55\mu m$ ($52\mu m-55\mu m$) in length and is placed posteriorly on the genital field; figure 155 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $14\mu m$ ($14\mu m$ - $16\mu m$); P-II, $62\mu m$ ($55\mu m$ - $60\mu m$); P-III, $41\mu m$ ($43\mu m$ - $46\mu m$); P-IV, $77\mu m$ ($73\mu m$ - $77\mu m$); P-V, $33\mu m$ ($31\mu m$); structure of palp as shown for the female; capitulum $148\mu m$ $(137\mu\text{m}-152\mu\text{m})$ in length; chelicera $177\mu\text{m}$ $(170\mu\text{m}-177\mu\text{m})$; in length; capitulum somewhat elongated and with small posterodorsal projections; capitulum somewhat protrusible; dorsal lengths of the distal segments of the first leg: I-Leg-4, $62\mu \text{m}$ (59 μm -61 μm); I-Leg-5, 79 μm (77 μm -78 μm); I-Leg-6, 103 μm (93 μm -100 μm); figure 158 shows I-Leg-5 and 6; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $69\mu m$ ($64\mu m$ - $72\mu m$); IV-Leg-5, $78\mu m$ ($71\mu m$ - $78\mu m$) IV-Leg-6, $69\mu m$ ($72\mu m$ - $79\mu m$); seta at tip of IV-Leg-6, $59\mu m$ ($59\mu m$ - $65\mu m$) in

length; figure 159 shows IV-Leg-5 and 6; swimming hairs absent.

Female: Dorsal and ventral shields present; dorsal shield $462\mu m$ ($449\mu m$ - $471\mu\mathrm{m}$) in length, $349\mu\mathrm{m}$ ($327\mu\mathrm{m}$ - $342\mu\mathrm{m}$) in width; dorsal shield as described for the male (fig. 157); ventral shield $547\mu m$ ($516\mu m-562\mu m$) in length, $380\mu m$ $(373\mu m-395\mu m)$ in width; genital field extending farther forward between the coxae than in the male, thereby lessening the length of the medial coxal suture lines; otherwise, except for genital field region, structure of ventral shield as described for male; genital field $126\mu m$ ($115\mu m$ - $126\mu m$) in length, $118\mu m$ ($118\mu m$ - $129\mu m$) in width; three pairs of genital acetabula, these relatively evenly spaced; genital field widest anteriorly; figure 154 illustrates the ventral shield; dorsal lengths of the palpal segments: P-I, $14\mu m$ ($14\mu m$ - $17\mu m$); P-II, $63\mu m$ ($62\mu m$ - $66\mu m$); P-III, $47\mu m$ ($48\mu m$ - $51\mu m$); P-IV, $84\mu m$ ($83\mu m$ - $88\mu m$); P-V, $35\mu m$ ($34\mu m$); μ m-38 μ m); ventral side of P-II with a short peg-like seta; figure 152 illustrates the proportions and chaetotaxy of the palp; capitulum $148\mu m$ ($159\mu m-163\mu m$) in length; chelicera $185\mu m$ ($177\mu m-192\mu m$) in length; figure 156 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $66\mu m$ ($59\mu m$ - $69\mu m$); I-Leg-5, $80\mu m$ ($80\mu m$ - $83\mu m$); I-Leg-6, $100\mu m$ ($104\mu m$); dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $73\mu m$ ($72\mu m$ - $76\mu m$); IV-Leg-5, $79\mu m$ ($78\mu m$ - $82\mu m$); IV-Leg-6, 83 μ m (80 μ m-82 μ m); seta at tip of IV-Leg-6, 62 μ m (72 μ m-83 μ m) in length; no swimming hairs present.

Holotype: Adult of, from a stream at Omaukoro Bridge on Rt. 2, in the

"Gorge" south of Opotiki, North Island, Oct. 29, 1982.

Allotype: Adult \mathcal{P} , same data as holotype.

Paratypes: NORTH ISLAND: 1 \(\frac{1}{2} \), from a stream on Wainui Rd, 5 km west of Mahinepua Rd (northern North Island), Oct. 22, 1982; 1 \(\sigma \), 1 \(\frac{1}{2} \), from a tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), Oct. 27, 1982; 1 \(\frac{1}{2} \), from a stream at Owhiritoa Bridge on Rt. 2, in the "Gorge" south of Opotiki, Oct. 29, 1982; 1 \(\sigma \), 1 \(\frac{1}{2} \), same data as holotype; SOUTH ISLAND: 1 \(\sigma \), from the Whangamoa River on Rt. 6, 3 km northeast of the Whangamoa Saddle, Nov. 6, 1982; 1 \(\sigma \), White Rock River, southeast of Timaru, where Cliffs Rd branches from Pareora-Cave Rd, Nov. 18, 1982; 1 \(\frac{1}{2} \), Kaituna River on Rt. 6, 5 km south of Havelock, Nov. 22, 1982; 3 \(\sigma \), from a tributary of the Waitapu River at Paynes Ford, 3 km south of Takaka, Nov. 24, 1982.

Discussion: The eight pairs of glandularia incorporated into the dorsal

shield are diagnostic.

Family HYGROBATIDAE Koch

Genus AUSTRALIOBATES Lundblad

<u>Discussion</u>: With the collection of four species of *Australiobates* in New Zealand, the genus becomes the first strictly austral group to be taken in four Gondwanan regions: Australia, South America, South Africa and New Zealand. The mites from New Zealand belong to a distinctive species group characterized by a great increase in both the number and length of the dorsal setae on P-III (and often on P-II) in males, and to a lesser degree in the females. This character state is synapomorphic for the New Zealand species of the genus. Also, when compared to other members of the typical subgenus, they have a relatively wide posterior capitular projection (figs. 160, 165). This projection is very similar

to that found in the subgenus *Coaustraliobates* but, with this exception, the New Zealand species fit well into the typical subgenus.

KEY TO THE NEW ZEALAND SPECIES OF AUSTRALIOBATES

I. IV-Leg-5 with eight to ten flexible swimming hairs, these spaced out
over distal half of segment A. solomis, new species (p. 29)
IV-Leg-5 with one to four stiff swimming hairs, these placed near
distal end of segment

REMAINDER OF KEY BASED ON MALES ONLY

- 3. Small species (729µm-760µm in length); gonopore much wider that diameter of an acetabulum (fig. 173); long dorsal setae of P-III not originating from proximal portion of segment (fig. 174)

 A. savanus, new species .(p. 30)

 Larger species (910µm-1060µm in length); gonopore approximately same width as an acetabulum (fig. 168); long setae on dorsal side of P-III originating along entire length of segment (fig. 169)

 A. setipalpis, new species ..(p. 31)

26. Australiobates vietsi, new species

(Figs. 160-164)

Male: Length of body $850\mu m$ ($760\mu m-940\mu m$); length between tips of first coxae and posterior end of genital field 755 \mu m (700 \mu m - 760 \mu m); coxae pigmented; first coxae separated medially; capitulum with a long posterior projection which is moderately wide and slightly tapering; capitulum with its projection $319\mu m$ in length; short projections present at posterior margins of fourth coxae; apodemes extending anteriorly from these projections to the glands of the fourth coxae; genital field subterminal and too foreshortened for accurate length measurements; primary sclerites of genital field $211\mu m$ ($190\mu m-196\mu m$) in width; the width including secondary sclerotization $236\mu m$ ($196\mu m-205\mu m$); gonopore $52\mu m$ $(56\mu m)$ in width; three pairs of genital acetabula; figure 163 shows the structure of the venter; dorsum soft and without dorsalia; dorsal lengths of the palpal segments: P-I, $33\mu m$ ($33\mu m$ - $35\mu m$); P-II, $121\mu m$ ($117\mu m$ - $121\mu m$); P-III, $117\mu m$ (112 μ m-ll4 μ m); P-IV, 171 μ m (169 μ m-175 μ m); P-V, 64 μ m (59 μ m-61 μ m); dorsodistal half of P-III with approximately 10 somewhat elongated setae; figure 161 shows the proportions and chaetotaxy of the palp; chelicera $325\mu m-340\mu m$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 242 \mu m (248 \mu m- $251\mu m$); I-Leg-5, $268\mu m$ ($259\mu m$ - $282\mu m$); I-Leg-6, $248\mu m$ ($251\mu m$ - $259\mu m$); first leg similar to that shown for the female; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $318\mu m$ ($311\mu m$ - $318\mu m$); IV-Leg-5, $348\mu m$ $(340\mu \text{m} - 355\mu \text{m})$; IV-Leg-6, $355\mu \text{m}$ $(359\mu \text{m} - 362\mu \text{m})$; end of IV-Leg-4 with two or three stiff swimming hairs; end of IV-Leg-5 with three or four stiff swimming hairs.

Female: Length of body $1290\mu m$ ($760\mu m$); length between anterior end of first coxae and posterior end of genital field $927\mu m$ ($714\mu m$ - $730\mu m$); coxal area rather similar to that of male although the coxal groups tend to be more separated from each other; capitulum and its posterior projection 358 µm in length; genital field $269\mu m$ ($222\mu m$) in width; three pairs of acetabula; figure 160 shows the structure of the venter; dorsum soft and without dorsalia; dorsal lengths of the palpal segments: P-I, $42\mu m$ ($40\mu m-42\mu m$); P-II, $131\mu m$ ($138\mu m-143\mu m$); P-III, $116\mu m$ ($121\mu m$ - $128\mu m$); P-IV, $185\mu m$ ($186\mu m$ - $201\mu m$); P-V, $66\mu m$ ($69\mu m$ - $72\mu m$); female lacking the patch of distodorsal elongated setae on P-III found in the male (fig. 164); dorsal lengths of the distal segments of the first leg: I-Leg-4, $259\mu m$ $(263\mu \text{m}-281\mu \text{m}); \text{I-Leg-5}, 278\mu \text{m} (278\mu \text{m}-296\mu \text{m}); \text{I-Leg-6}, 248\mu \text{m} (259\mu \text{m}-281\mu \text{m}); \text{I-Leg-6}, 248\mu \text{m}); \text{I-Leg-6}, 248\mu \text{m} (259\mu \text{m}-281\mu \text{m}); \text{I-Leg-6}, 248\mu \text{m}); \text{I-Leg-6}, 248\mu \text{m} (258\mu \text{m}-281\mu$ $270\mu m$); figure 162 shows the morphology of these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $333\mu m$ ($333\mu m$ - $355\mu m$); IV-Leg-5, $363 \mu \text{m}$ ($348 \mu \text{m} - 392 \mu \text{m}$); IV-Leg-6, $359 \mu \text{m}$ ($355 \mu \text{m} - 389 \mu \text{m}$); end of IV-Leg-4 with two or three stiff swimming hairs; end of IV-Leg-5 with three or four stiff swimming hairs.

Holotype: Adult of, from Mangamawhete Stream on Rt 3, between Inglewood and Stratford (Egmont area), North Island, Nov. 1, 1982.

Allotype: Adult \(\begin{aligned} \text{, same data as holotype.} \end{aligned} \)

Paratypes: 1 of, 1 \, tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), Oct. 27, 1982; 1 of, 1 \, same data as holotype.

<u>Discussion</u>: The present species differs from the other three New Zealand species in its simpler chaetotaxy of the palp. Males have a distal patch of about 10 somewhat elongated setae on the dorsal side of P-III but the female lacks the elongated setae on the palp. The pigmentation of the coxae is much darker in the present species and the structure and numbers of swimming hairs on the fourth leg are diagnostic (two or three stiff swimming hairs on IV-Leg-4, three or four stiff swimming hairs on IV-Leg-5).

27. Australiobates savanus, new species

(Figs. 172-174)

Male: Length of body $729\mu m$ ($760\mu m$); length between anterior end of first coxae and posterior end of genital field 668 µm (684 µm); coxae a light brownish color; first coxae separated medially; capitululum with a long posterior projection which is moderately wide and noticeably tapering posteriorly; capitulum with its projection $258\mu m$ ($289\mu m$) in length; short projections present at posterior end of fourth coxae, apodemes extending anteriorly from this projection to the glands of the fourth coxae; genital field subterminal and too foreshortened for accurate length measurements; genital field $148\mu m$ ($177\mu m$) in width; gonopore $52\mu m$ in width; typically with three pairs of genital acetabula, but one is missing on one side in one of the two known specimens; figure 173 shows the structure of the venter; dorsum soft and without dorsalia; dorsal lengths of the palpal segments: P-I, $27\mu m$ ($35\mu m$); P-II, $88\mu m$ ($96\mu m$); P-III, $86\mu m$ ($97\mu m$); P-IV, $124\mu m$ ($138\mu m$); P-V, $52\mu m$ ($59\mu m$); dorsodistal portion of P-II with four very long setae; dorsodistal portion of P-III with approximately eight very long setae; figure 174 shows the structure of the palp; chelicera $288\mu m$ ($310\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $182\mu m$ $(207\mu m)$; I-Leg-5, $196\mu m$ $(229\mu m)$; I-Leg-6, $185\mu m$ $(222\mu m)$; figure 172 illustrates the proportions and chaetotaxy of these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $258\mu m$ ($303\mu m$); IV-Leg-5, $289\mu m$ ($333\mu m$); IV-Leg-6, $278\mu m$ ($310\mu m$); end of IV-Leg-4 with one stiff swimming hair; end of IV-Leg-5 with two stiff swimming hairs.

Female: Unknown.

Holotype: Adult of, from Waitaanga Stream near the town of the same name, on Rt 40 west of Ohura, North Island, Oct. 31, 1982.

Paratype: 1 of, same data as holotype.

Discussion: This is a much smaller species than the other three New Zealand members of the genus. It differs from the previous species in having four long setae on dorsodistal portion of P-II and, although there are roughly the same number of long setae on P-III in the two species, those of the present species are much longer (compare figures 174, 161).

28. Australiobates setipalpis, new species

(Figs. 165-169)

Male: Length of body $990\mu m$ ($910\mu m$ - $1060\mu m$); length between tips of first coxae and posterior end of genital field 927 μ m (866 μ m-958 μ m); coxae a light brown in color; first coxae separated medially; capitulum with a long posterior projection which is moderately wide; capitulum and its projection $289\mu m$ in length; short projections at posterior end of fourth coxae; apodemes extending anteriorly from these projections to the glands of the fourth coxae; genital field subterminal and too foreshortened for accurate length measurements; genital field $200\mu \text{m}$ (199 μm -207 μm) in width; gonopore $64\mu \text{m}$ (53 μm -67 μm) in width; figure 168 shows the structure of the venter; dorsum soft and without dorsalia; dorsal lengths of the palpal segments: P-I, $40\mu m$ ($35\mu m$ - $41\mu m$); P-II, $135\mu m$ $(117\mu \text{m}-138\mu \text{m}); \text{ P-III}, 121\mu \text{m} (114\mu \text{m}-128\mu \text{m}); \text{ P-IV}, 190\mu \text{m} (166\mu-197\mu \text{m}); \text{ P-V},$ $69\mu \text{m}$ ($66\mu \text{m}$ - $70\mu \text{m}$); dorsodistal portion of P-II with six or seven very long setae; entire dorsal side of P-III with numerous very long setae; figure 169 shows these unusual setae; chelicera $199\mu m$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $244\mu m$ ($259\mu m$ - $310\mu m$); I-Leg-5, $303\mu m$ (281) μ m-340 μ m); I-Leg-6, 259 μ m (266 μ m-303 μ m); first leg similar to that shown for the female; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $418\mu m$ ($358\mu m$ - $434\mu m$); IV-Leg-5, $471\mu m$ ($403\mu m$ - $486\mu m$); IV-Leg-6, 471 μ m (410 μ m-486 μ m); end of IV-Leg-4 with one stiff swimming hair; end of IV-Leg-5 with two stiff swimming hairs; dorsal side of I-Leg-2 and 3 with numerous relatively long, fine setae; II-Leg-3 and III-Leg-3 also bearing this same type of setae.

Female: Length of body $1370\mu m$ ($1100\mu m$ – $1520\mu m$); length between anterior end of first coxae and posterior end of genital field $1065\mu m$ ($910\mu m$ – $1150\mu m$); the coxal area rather similar to that of male except that the coxal groups tend to be more widely separated from each other; capitulum with its projection $434\mu m$ in length; genital field $259\mu m$ ($244\mu m$ – $266\mu m$) in width; length between anterior end of pregenital sclerite and posterior end of postgenital scletite $244\mu m$ ($222\mu m$ – $252\mu m$); three pairs of genital acetabula; figure 165 shows the structure of the venter; dorsum soft and without dorsalia; dorsal lengths of the palpal segments: P-I, $43\mu m$ ($37\mu m$ – $45\mu m$); P-II, $138\mu m$ ($128\mu m$ – $140\mu m$); P-III, $128\mu m$ ($121\mu m$ – $126\mu m$); P-IV, $197\mu m$ ($180\mu m$ – $201\mu m$); P-V, $76\mu m$ ($63\mu m$ – $73\mu m$); female lacking the dense grouping of long setae on P-II and P-III but with scattered setae of moderate length in the same areas (fig. 166); chelicera $218\mu m$ ($199\mu m$ – $226\mu m$)

in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $288\mu m$ ($266\mu m$ - $284\mu m$); I-Leg-5, $316\mu m$ ($293\mu m$ - $308\mu m$); I-Leg-6, $281\mu m$ ($263\mu m$ - $278\mu m$); figure 167 shows these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $403\mu m$ ($380\mu m$ - $395\mu m$); IV-Leg-5, $439\mu m$ ($414\mu m$ - $441\mu m$); IV-Leg-6, $418\mu m$ ($380\mu m$ - $405\mu m$); end of IV-Leg-4 with one stiff swimming hair; end of IV-Leg-5 with two stiff swimming hairs.

Holotype: Adult of, from Pohue Stream at Waiomu (Coromandel Peninsula),

North Island, Oct. 26, 1982.

Allotype: Adult 9, same data as holotype.

Paratypes: NORTH ISLAND: 4 of, 3 \, same data as holotype; 1 of, 1 \, from a tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), Oct. 27, 1982; 3 of, Waitaanga Stream near town of same name, on Rt. 40 west of Ohura, Oct. 31, 1982; 2 of, 1 \, from stream on Rt 32, at Kakao Rd turnoff (northwest of Taupo), Nov. 3, 1982; 1 of, 3 9, Opupoto Stream on Rt 32, west of Lake Taupo, Nov. 3, 1982; SOUTH ISLAND: 1 of, Opouri River between Carluke and Opouri Valley on Tennyson Inlet Rd, Nov. 6, 1982; 19, in the Wind Bag River on Rt 6, between Lake Paringa and Lake Moeraki (north of Haast), Nov. 10, 1982; 7 of, 6 ♀, Catlin River on Morris Saddle Rd (in Catlin State Forest area), between Lawanui and Owaka, Nov. 12, 1982; 15 of, 6 9, from the MacLennan River at bridge on Aurora Creek Rd (Catlin State Forest area) between Puketiro and Rt 92, Nov. 12, 1982; 6 of, 6 \(\gamma\), from a tributary of the Tahakopa River on Tahakopa Rd, 5.5 km from Waikawa Valley rd, Nov. 21, 1982; 4 of, 4 \, Pourakino River at Pourakino Picnic Grounds (Longwood State Forest) on Harrington Rd south of Otautau, Nov. 13, 1982; 1 of, small creek on Rt 6, approximately 10 km west of Havelock, Nov. 22, 1982.

Discussion: Males of this species exhibit the greatest development of long setae on P-II and P-III (fig. 169). The female bears fewer and shorter setae in these positions but do have more (four) setae of moderate length on the dorsodistal portion of P-II than in any other known female of the genus. The number of swimming hairs (two stiff setae on IV-Leg-4 and one stiff seta on IV-Leg-5) is also characteristic of the previous species, in which the female is unknown. However, the latter is a much smaller species and it is likely the posterior projection of the capitulum will be more tapering than in the present species (compare figures 165, 173).

29. Australiobates solomis, new species

(Figs. 170, 171)

Female: Length of body 1400μm (1140μm-1220μm); length between anterior tips of first coxae and posterior end of genital field $1095\mu m$ ($965\mu m$ - $1060\mu m$); coxae a light brown color; first coxae separated medially; capitulum with a long posterior projection which is moderately wide and gradually tapers posteriorly; capitulum with its projection $410\mu m$ in length; short projections at posterior end of fourth coxae; apodemes extending anteriorly from these projections to the glands of the fourth coxae; genital field $281\mu m$ ($259\mu m$ - $274\mu m$) in width; length between anterior end of pregenital sclerite and posterior end of postgenital sclerite $244\mu m$ ($244\mu m$ - $258\mu m$); figure 170 shows the structure of the venter; dorsum soft and without dorsalia; dorsal lengths of the palpal segments: P-I, $46\mu m$ ($42\mu m$ - $48\mu m$); P-II, $145\mu m$ ($138\mu m$ - $155\mu m$); P-III, $131\mu m$ ($118\mu m$ - $138\mu m$); P-IV, $211\mu m$ ($190\mu m$ - $231\mu m$); P-V, $69\mu m$ ($69\mu m$ - $80\mu m$); P-III with a dorsodistal patch of moderately long setae (fig. 171); chelicera $203\mu m$ ($227\mu m$ - $236\mu m$) in length;

dorsal lengths of the distal segments of the first leg: I-Leg-4, $307\mu m$ ($259\mu m$ - $347\mu m$); I-Leg-5, $340\mu m$ ($259\mu m$ - $347\mu m$); I-Leg-6, $288\mu m$ ($245\mu m$ - $310\mu m$); dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $440\mu m$ ($334\mu m$ - $410\mu m$); IV-Leg-5, $471\mu m$ ($364\mu m$ - $440\mu m$); IV-Leg-6, $456\mu m$ ($350\mu m$ - $433\mu m$); IV-Leg-4 with five to seven flexible swimming hairs; IV-Leg-5 with eight to ten flexible swimming hairs; these swimming hairs extending over distal half of segments; the second and third legs also with many swimming hairs in the same positions.

Male: Unknown.

Holotype: Adult 9, from the Wind Bag River on Rt 6, between Lake Paringa

and Lake Moeraki (north of Haast), South Island, Nov. 10, 1982.

Paratypes: NORTH ISLAND: 1, from Pohue Stream at Waiomu (Coromandel Peninsula), Oct. 26, 1982; 3, from the Kotare "River" on Rt 30, Oct. 31, 1982; SOUTH ISLAND: 1, same data as holotype; 1, from Cole Creek on Rt. 6, between Lake Moeraki and Haast, Nov. 10, 1982.

Discussion: Since the male is unknown, the development of the dorsal setae on P-II and P-III cannot be compared with the other three species. However, a patch of moderately long setae on P-III of the female suggests the male will have numerous setae on both P-II and P-III. The diagnostic characteristic of the present species is the numerous thin, flexible swimming hairs on the fourth and fifth segments of the second, third and fourth legs.

Genus NOTOHYGROBATES, new genus

<u>Diagnosis</u>: Dorsum with a large anterior plate bearing the postocularia, two pairs of smaller dorsalia and a pair of greatly enlarged glandularia (fig. 182); first coxae separated; capitulum with a long, very narrow posterior projection; some muscle scarring present but no distinct apodemes extending from posterior projections of fourth coxae to the glands of the fourth coxae; three pairs of genital acetabula; gonopore and acetabula small and occupying only a small portion of the genital field; palp with papillae-bearing ventral bulges on P-II and P-III, and a peg-like seta near middle of ventral side of P-IV; swimming hairs absent.

Type Species: Notohygrobates kathrynae, new species

Discussion: The new genus exhibits a mixture of character states used to define several austral South American genera and I am presently uncertain as to its affinities. It is expected that a later study of new material from Chile will permit a more exanct placement of the new genus within the system. For the present, however, the combination of separated first coxae and long projection on the capitulum plus the structure of the palp (papillate ventral projections on P-II and P-III; peg-like seta near middle of ventral side of P-IV) will easily separate the new genus from all other known hygrobatids.

30. Notohygrobates kathrynae, new species

(Figs. 181-185)

<u>Male</u>: Both integumental and eye pigment absent; body $486\mu m$ in length; the first coxae separated medially; capitulum with a long, narrow posterior projection; total length of capitulum and its projection $228\mu m$; posterior margins of fourth coxae extending posterolaterally and with short posterior projections; muscle attachment scars forming a rather ill defined apodeme which extends a short distance forward on the fourth coxae but not nearly to the glands of the

fourth coxae; genital field $129\mu m$ in length, $133\mu m$ in width; three pairs of genital acetabula, these small and occupying only a small area of the genital field; gonopore small, $27\mu m$ in length; small sclerites flanking the genital field laterally; excretory pore lying free in the integument immediately posterior to the genital field; figure 181 shows a ventral view; dorsum with an anteromedial plate $133\mu m$ in length, $185\mu m$ in width; this plate bearing the postocularia; two pairs of small dorsalia also present; posterolateral portion of dorsum with a pair of greatly enlarged glandularia tubercles; arrangement of the other dorsal glandularia better illustrated (fig. 182) than described; dorsal lengths of the palpal segments: P-I, $27\mu m$; P-II, $82\mu m$; P-III, $72\mu m$; P-IV, $104\mu m$; P-V, $34\mu m$; ventral side of P-II and P-III bulging and with numerous, small papillae; ventral side of P-IV with a short peg-like seta; figure 185 shows the proportions and chaetotaxy of the palp; chelicera $170\mu m$ in length (fig. 183); dorsal lengths of the distal segments of the first leg: I-Leg-4, $111\mu m$; I-Leg-5, $109\mu m$; I-Leg-6, $117\mu m$; figure 184 illustrates these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 148 μ m; IV-Leg-5, 159 μ m; IV-Leg-6, 163 μ m; swimming hairs absent.

Female: Unknown.

Holotype: Adult of, from a stream 1 km north of Tohere (east of Opotiki on Rt. 35), North Island, Oct. 29, 1982.

Discussion: The characters given in the generic diagnosis will easily separate the present species from all other known hygrobatids.

Genus HOPKINSOBATES, new genus

Diagnosis: Dorsal and ventral shields present; dorsal shield consisting of a large anterior plate and smaller posterior plate which are very slightly fused; anterior plate bearing the postocularia and two pairs of setae (actually glandularia in which the gland portion has disappeared); posterior plate bearing two pairs of glandularia, of which the most posterior are greatly enlarged; posterior plate also with three pairs of setae which likely mark the sites of additional glandularia in which the gland portion has disappeared (fig. 175); ventral shield entire and incorporating the genital field; first three pairs of coxae placed well anterior on the ventral shield; median suture lines of second, third and fourth coxae evident; glands of the fourth coxae extending far forward, producing an S-shaped suture line between the third and fourth coxae (fig. 177); coxal projections present at insertions of fourth legs; three pairs of genital acetabula, these placed posterior to the gonopore; sexual dimorphism largely confined to the size of the gonopore; excretory pore incorporated into the ventral shield; palp with a heavy, curved seta on medial side of P-III; capitulum with a very long anchoral process.

Type Species: Hopkinsobates suzannae, new species.

Discussion: Hopkinsobates shares some character states with an undescribed genus from Australia but seems closest to the New World genus Diamphidaxona. Hopkinsobates and Diamphidaxona both have divided dorsal shields, but the anterior plate is much smaller than the posterior plate in the latter genus. Both share a similar reduction in the gland portion of the dorsal glandularia. The anterior plate of both genera bear the postocularia and two pairs of setae (glandularia homologs), but the preocularia are incorporated into the plate in Diamphidaxona, free in the dorsal furrow of the New Zealand genus. The posterior plate bears enlarged glandularia in both genera as well as several pairs of setae which are likely glandularia homologs. Similarities of the ventral shield include the

unusual anterior shifting of the glands of the fourth coxae (fig. 177) which is almost certainly synapomorphic. A somewhat similar shifting of the glands of the fourth coxae has occurred in *Hygrobatides*, a subgenus of *Hygrobates*. However, other than both being hygrobatids, the two groups are not closely related and the shifting of the glands has occurred independently from a "typical" straight suture line in each line of evolution. Other similarities between *Hopkinsobates* and *Diamphidaxona*, which may or may not be shared apomorphisms, are the far anterior placement of the first three pairs of coxae and the well developed projections associated with insertions of the fourth legs which extend noticeably anterolaterally. Major differences in the ventral shield are a median coxal suture line present and genital field fused with the ventral shield in the New Zealand genus. The legs, capitulum with its long anchoral process, and palp are also very similar in the two genera.

31. Hopkinsobates suzannae, new species

(Figs. 175-180)

Male: Dorsal and ventral shields present; integument colorless; eye pigment reduced in size; dorsal shield $365\mu m$ ($362\mu m$) in length, $228\mu m$ ($217\mu m$) in width; dorsal shield divided; posterior plate $61\mu m$ ($60\mu m$) in length; anterior and posterior plates slightly fused but suture lines well developed; anterior plate bearing the postocularia and two pairs of setae (homologs of glandularia); posterior plate with a pair of "normal" glandularia near the suture line between the two paltes and enlarged glandularia posteriorly; three pairs of setae (likely representing homologs of glandularia) also on the posterior plate; structure of dorsal shield as illustrated for the female; ventral shield $388\mu m$ ($399\mu m$) in length, $243 \mu \text{m}$ (239 μm) in width; anterior coxae projecting; suture lines of first, second and third coxae developed, although those between second and third coxae are shortest; glands of the fourth coxae extending forward in a line with the epimeroglandularia l and form a loop-like suture line between the third and fourth coxae; median coxal suture line well developed; openings for insertion of the fourth legs partially covered by flap-like projections which extend somewhat anterolaterally; a pair of apophyses present near posterior area of fourth coxae; genital field incorporated into the ventral shield without a trace of a suture line; three pairs of genital acetabula; width between outer edges of second pair 96µm (89 μ m); gonopore small, 17 μ m (14 μ m) in length, and placed anterior to the acetabula; excretory pore lying on the ventral shield; figure 179 shows the ventral shield; dorsal lengths of the palpal segments: P-I, $12\mu m$ ($14\mu m$); P-II, $45\mu m$ $(46\mu m)$; P-III, $32\mu m$ $(33\mu m)$; P-IV, $46\mu m$ $(46\mu m)$; P-V, $24\mu m$ $(22\mu m)$; one thickened, posteromedial seta on P-III; figure 180 illustrates the proportions and chaetotaxy of the palp; capitulum, including the long anchoral process, lll μm (114 μm) in length; chelicera 107 μm (100 μm) in length; structure of the capitulum and chelicera as shown for the female; dorsal lengths of the distal segments of the first leg: I-Leg-4, $54\mu m$ ($57\mu m$); I-Leg-5, $55\mu m$ ($55\mu m$); I-Leg-6, $60\mu \text{m}$ ($62\mu \text{m}$); these segments as shown for the female; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $76\mu m$ ($76\mu m$); IV-Leg-5, $87\mu m$ $(83\mu m)$; IV-Leg-6, $83\mu m$ $(79\mu m)$; swimming hairs absent.

Female: Dorsal and ventral shields, except for genital field area, as described for male; dorsal shield $403\mu m$ ($388\mu m-429\mu m$) in length, $243\mu m$ ($217\mu m-243\mu m$) in width; posterior plate of dorsum $76\mu m$ ($72\mu m-76\mu m$) in length; ventral shield $426\mu m$ ($410\mu m-456\mu m$) in length, $258\mu m$ ($243\mu m-274\mu m$) in width;

three pairs of genital acetabula; width between outer edges of most lateral pair $103\mu m$ ($100\mu m$ -Ill μm); gonopore placed farther forward than in male; gonopore $55\mu m$ ($53\mu m$) in length, $31\mu m$ ($29\mu m$ - $30\mu m$) in width; postgenital sclerite area prominent; figure 177 illustrates the ventral shield; dorsal lengths of the palpal segments: P-I, $12\mu m$ ($14\mu m$); P-II, $48\mu m$ ($50\mu m$ - $53\mu m$); P-III, $36\mu m$ ($35\mu m$ - $40\mu m$); P-IV, $48\mu m$ ($47\mu m$ - $52\mu m$); P-V, $25\mu m$ ($25\mu m$ - $26\mu m$); palp similar to that of male, with the heavy seta on medial surface of P-III present; capitulum $114\mu m$ ($109\mu m$ - $121\mu m$) in length; chelicera $107\mu m$ ($104\mu m$ - $107\mu m$) in length; figure 178 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $57\mu m$ ($55\mu m$ - $62\mu m$); I-Leg-5, $59\mu m$ ($56\mu m$ - $59\mu m$); I-Leg-6, $66\mu m$ ($62\mu m$ - $67\mu m$); figure 176 illustrates these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $80\mu m$ ($76\mu m$ - $83\mu m$); IV-Leg-5, $85\mu m$ ($86\mu m$ - $90\mu m$); IV-Leg-6, $83\mu m$ ($83\mu m$ - $87\mu m$); swimming hairs absent.

Holotype: Adult of, from a tributary of the Motupiko River on Rt. 6, between

Korere and Glenhope, South Island, Nov. 25, 1982.

Allotype: Adult \mathcal{L} , same data as holotype.

Paratypes: SOUTH ISLAND: 2 \(\), same area as holotype on Nov. 7, 1982; 1 \(\), same data as holotype; 1 \(\), from the Hope River on Rt. 6, between Glenhope and Kawatiri, Nov. 25, 1982.

Discussion: The characteristics given in the generic diagnosis will easily

separate the present form from all other known species.

Genus ASPIDIOBATES Lundblad

32. Aspidiobates orbiculatus Hopkins

(Figs. 186-189, 192)

Aspidiobates orbiculatus Hopkins, 1975. Jour. Royal Soc. New Zealand, 5: 5.

Female: Dorsal and ventral shields present; dorsal shield entire, $851\mu m$ in length, 714µm in width; dorsal shield bearing the postocularia and three pairs of glandularia; two pairs of glandularia lying in the dorsal furrow; figure 188 shows the structure of the dorsal shield; ventral shield $966\mu\mathrm{m}$ in length, $820\mu\mathrm{m}$ in width; first coxae projecting slightly beyond body; coxal area confined to the anterior half of ventral shield; glands of the fourth coxae extending forward to form a loop-like suture line which constricts the more medial portion of the third coxae; muscle scar apodemes forming the lateral edges of the loop cause the fourth coxae to appear rectangular; three pairs of genital acetabula; width between outer edges of second pair of genital acetabula $259\mu\mathrm{m}$; gonopore $162\mu\mathrm{m}$ in length, $155\mu m$ in width; a pair of apophyses present lateral to the genital field; figure 189 illustrates the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $29\mu \text{m}$; P-II, $103\mu \text{m}$; P-III, $111\mu \text{m}$; P-IV, $143\mu \text{m}$; P-V, 26μm; medial surface of P-IV with a peg-like seta; figure 192 shows the proportions and chaetotaxy of the palp; capitulum $251\mu m$ in length; chelicera $273\mu m$ in length; figure 186 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $200\mu m$; I-Leg-5, $192\mu \text{m}$; I-Leg-6, $177\mu \text{m}$; figure 187 shows I-Leg-5 and 6; swimming hairs absent.

Male: See Hopkins (1975).

Material Examined: I did not recollect this seepage area form and the il-

lustrations are based on a specimen sent to me by Dr. Ceri Hopkins. It is included only for the sake of completeness and to use in later comparisons with the Australian members of the genus.

Genus ACICULACARUS Hopkins

33. Aciculacarus papillosus Hopkins

(Figs. 190, 191, 193-197)

Aciculacarus papillosus Hopkins, 1975. Jour. Royal Soc. New Zealand, 5: 7.

Male: A completely sclerotized ventral shield present but dorsum soft; ventral shield $593\mu \text{m} - 623\mu \text{m}$ in length, $410\mu \text{m} - 441\mu \text{m}$ in width; anterior coxae projecting; suture lines of the individual coxal groups evident, except no medial suture lined for first coxae; glands of the fourth coxae located medially near suture line between third and fourth coxae; posterior suture lines of fourth coxae evident and extending at right angles to the long axis of the body; genital field lying on a plate (homologous to that shown in figure 201) which is incorporated into the ventral shield but the suture line is distinct; width of this plate $192\mu\mathrm{m}$ - $222\mu m$; three pairs of genital acetabula; width between outer edges of middle pair of acetabula $141\mu \text{m}-155\mu \text{m}$; gonopore $25\mu \text{m}-26\mu \text{m}$ in width; excretory pore terminal; figure 193 shows the structure of the ventral shield; dorsum soft and bearing the pre- and postocularia, five pairs of 'normal' glandularia and two pairs of setae (which apparently are the homologs of an additional two pairs of glandularia); dorsum as shown for the female; dorsal lengths of the palpal segments: P-I, $27\mu\text{m}$ - $29\mu\text{m}$; P-II, $59\mu\text{m}$ - $63\mu\text{m}$; P-III, $65\mu\text{m}$ - $67\mu\text{m}$; P-IV, $100\mu\text{m}$ - $102\mu m$; P-V, $29\mu m$ - $31\mu m$; figure 190 shows the proportions and chaetotaxy of the palp; capitulum 177μ m- 185μ m in length; capitulum tapering more or less to a point anteriorly; chelicera $288\mu \text{m}$ - $311\mu \text{m}$ in length; cheliceral claw elongated and needle-like (fig. 195); dorsal lengths of the distal segments of the first leg: I-Leg-4, $104\mu \text{m}$ - $109\mu \text{m}$; I-Leg-5, $114\mu \text{m}$ - $117\mu \text{m}$; I-Leg-6, $131\mu \text{m}$ - $133\mu \text{m}$; these segments as in the female; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $149\mu\text{m}$ - $156\mu\text{m}$; IV-Leg-5, $162\mu\text{m}$ - $173\mu\text{m}$; IV-Leg-6, $147\mu\text{m}$ -162μm; swimming hairs absent.

Female: The unsclerotized dorsum and the ventral shield (except for genital field region) as described for male; figure 194 shows the dorsum; ventral shield $623\,\mu\text{m}$ - $707\,\mu\text{m}$ in length, $456\,\mu\text{m}$ - $532\,\mu\text{m}$ in width; genital field on a plate fused with the ventral shield but the suture lines of this plate are evident; width of this plate $222\,\mu\text{m}$ - $236\,\mu\text{m}$; three pairs of genital acetabula; width between outer edges of most lateral pair of acetabula $183\,\mu\text{m}$ - $185\,\mu\text{m}$; gonopore $103\,\mu\text{m}$ - $110\,\mu\text{m}$ in width; figure 197 illustrates the ventral shield; dorsal lengths of the palpal segments: P-I, $31\,\mu\text{m}$ - $35\,\mu\text{m}$; P-II, $63\,\mu\text{m}$ - $69\,\mu\text{m}$; P-III, $71\,\mu\text{m}$ - $75\,\mu\text{m}$; P-IV, $107\,\mu\text{m}$ - $111\,\mu\text{m}$; P-V, $31\,\mu\text{m}$ - $32\,\mu\text{m}$; structure of palp as in male; capitulum $185\,\mu\text{m}$ - $211\,\mu\text{m}$ in length; chelicera $318\,\mu\text{m}$ in length; figure 191 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $107\,\mu\text{m}$ - $112\,\mu\text{m}$; I-Leg-5, $117\,\mu\text{m}$ - $121\,\mu\text{m}$; I-Leg-6, $133\,\mu\text{m}$ - $136\,\mu\text{m}$; figure 196 shows these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $155\,\mu\text{m}$ - $159\,\mu\text{m}$; IV-Leg-5, $172\,\mu\text{m}$ - $185\,\mu\text{m}$; IV-Leg-6, $163\,\mu\text{m}$ - $167\,\mu\text{m}$; swimming hairs absent.

Material Examined: NORTH ISLAND: 2 of, 1 after a tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula),

Oct. 27, 1982; 1, from a stream on Rt 6, just north of the Makatote Viaduct between Raetiki and National Park, Nov. 2, 1982; SOUTH ISLAND: 1, from a tributary of the Motupiko River on Rt. 6, between Korere and Glenhope, Nov. 7, 1982; 1, same area on Nov. 25, 1982.

Discussion: Aciculacarus papillosus belongs to a group of austral hygrobatids which includes Rhynchaturus (Chile and Argentina) and at least four undescribed species from Australia. Other members of the group have mouthparts capable of a great deal of protrusion, but not the present species. This group of mites exhibits varying degrees of sclerotization. Some, like the following species, lack secondary sclerotization and others, such as Rhynchaturus, have both dorsal and ventral shields (although the dorsal shield is made up of several closely fitting platelets). Three of the four Australian species have ventral shields as does the present species. An examination of the Australian species of this group indicates that the two pairs of setae slightly anterior to the four glandularia sclerites at the posterior end of the dorsal shield (fig. 194) represent homologs of glandularia in which the gland portion has disappeared. In one of the Australian species, one pair of these posterior glandularia has become reduced to setal bases as in the present species. The New Zealand species of the group are characterized by having two of the glandularia pairs of the dorsum losing the gland portion and in having extremely enlarged cheliceral claws, both of which appear to be synapomorphic. The whole group will be analysed at the time the Australian species are described. The following species, although appearing quite different because of its unsclerotized venter, is related to the present species.

34. Aciculacarus amilis, new species

(Figs. 198-202)

Male: Body, other than the primary sclerites, soft and without muscle attachment platelets; body $487\mu m$ in length; first coxae separated medially; capitular bay V-shaped; epimeroglandularia I fused with the second coxae; glands of the fourth coxae near medial margins of fourth coxae and well posterior to the suture line between third and fourth coxae; posterior suture lines of fourth coxae evident; epimeroglandularia 2 lying in sclerotization immediately posterior to the fourth coxae; genital field lying on a plate $118\mu m$ in length, $177\mu m$ in width; three pairs of genital acetabula, width between outer edges of second pair 140 μ m; gonopore 44μ m in length; genital field with numerous setae, both lateral and medial to the acetabula; excretory pore not on a sclerite and is terminal in position; figure 201 illustrates the venter; dorsum with the pre- and postocularia, five pairs of "normal" glandularia posterior to the postocularia, and two pairs of setae (which are the homologs of glandularia); figure 200 shows the dorsum; dorsal lengths of the palpal segments: P-I, $21\mu m$; P-II, $58\mu m$; P-III, $60\mu m$; P-IV, $88\mu m$; P-V, $38\mu m$; figure 198 shows the proportions and chaetotaxy of the palp; capitulum $200\mu m$ in length; capitulum elongated, pointed at anterior end and attached to a tube of soft integument to form protrusible mouthparts; chelicera $303\mu m$ in length; cheliceral claw elongated and needle-like; figure 202 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $104\mu m$; I-Leg-5, $107\mu m$; I-Leg-6, 121 μ m; figure 199 illustrates these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $138\mu m$; IV-Leg-5, $159\mu m$; IV-Leg-6, $149\mu m$; swimming hairs absent.

Female: Unknown.

Holotype: Adult of, from a stream at Sandy's Bridge on Rt. 2, in the "Gorge"

south of Opotiki, North Island, June 3, 1981.

<u>Discussion</u>: As mentioned under the discussion section of the previous species, the major differences between these two New Zealand forms are the unsclerotized venter of the present species and its proportionally longer and more protrusible capitulum.

The CORTICACARUS-like Mites

Discussion: Four members of the *Corticacarus*-like hydrachnids are now known from New Zealand: *Zelandobatella naias*, *Zelandobates crinitus*, and two new species tentatively assigned to the latter genus. The *Corticacarus*-like forms have a wide range in the New World, with a few species occurring in the austral portion of South America, the bulk of the species confined to the neotropics, and one species taken as far north as Idaho in the United States. Five species assigned to a new subgenus of *Corticacarus*, *Procorticacarus*, have been described by K. O. Viets (1978b) from Australia. Additional species from Australia which are presently undescribed will bring the total to at least 14, and all fit well in *Procorticacarus*. New Zealand, with only four species, is the most species impoverished.

The *Corticacarus*-like hydrachnids of Australia, New Zealand and the New World exhibit certain rather stable differences from each other suggesting they have been isolated for a long time. Three major characters are here used to distinguish the mites of each area: Glandularia of the dorsum, morphology of the male gonopore and presence or absence of a projection on the ventral side of P-II.

NEW ZEALAND: (1) All glandularia of the dorsum of approximately the same size and morphology (2) No ventral projection on P-II (3) Male gonopore relatively long and narrow, and unspecialized. Utilizing other southern hygrobatids for out group comparisons, it seems certain all three of these character states are plesiomorphic.

AUSTRALIA: (1) All glandularia of the dorsum of approximately the same size and morphology (2) A ventral projection is present on P-II (3) Male gonopore is shortened and proportionally widened. The last two character states are

apomorphic relative to the New Zealand mites.

NEW WORLD: (1) Four pairs of the dorsal glandularia typically enlarged and somewhat heart-shaped, others similar to those found in the Australasian mites (2) P-II, with rare exceptions, with a ventral projection (3) Male gonopore shortened and generally widened. All three of these character states are apomorphic relative to the New Zealand species but only the first character state is derived relative to the Australian corticacarids.

It is tempting to consider the less derived condition of the New Zealand species to be the result of the earlier separation of this region while the other two were still joined as part of Gondwanaland. However, far more characters need to be examined and the results of a collecting trip to Chile incorporated before any conclusions should be drawn.

Genus ZELANDOBATES Hopkins

Diagnosis: Characters of the New Zealand Corticacarus-like mites as given earlier on this page; surface of integument and plates varying from relatively

smooth to rough and papillose; first coxae fused medially; genital field flanked by two pairs of muscle attachment platelets (fig. 208); anterior portion of male dorsum with a large anteromedial plate bearing the postocularia and three pairs of glandularia; posterior portion of male dorsum with a smaller median platelet and two lateral platelets (figs. 206, 226); female dorsum similar but anterodorsal plate smaller and bearing only the postocularia; three pairs of glandularia sclerites, one of which is associated with muscle attachment platelets, are free in the integument surrounding the anteromedial plate (these three glandularia sclerites fused with the anteromedial plate in the male).

35. Zelandobates crinitus Hopkins

(Figs. 223-227, 229, 231)

Zelandobates crinitus Hopkins, 1966. Trans. Royal Soc. New Zealand, 8: 113.

Male: Integument finely lined, but with development of dorsal sclerites so extensive as to nearly form a dorsal shield; dorsal and ventral sclerites relatively smooth; body $470\mu \text{m}$ - $492\mu \text{m}$ in length; dorsum with a large anteromedial plate $354\mu \text{m} - 380\mu \text{m}$ in length, $304\mu \text{m} - 319\mu \text{m}$ in width; this plate bearing the postocularia and three pairs of glandularia; two of the glandularia on the dorsal plate and one pair flanking it with very long setae; antenniform setae located on a common sclerite; one small median and two pairs of small lateral platelets near posterior end of dorsum; figure 226 illustrates these sclerites; length between anterior end of first coxae and posterior end of genital field $458\mu m-472$ μm; first coxae fused medially; capitular bay V-shaped; epimeroglandularia l fused with the second coxae; medial margins of the posterior coxal groups long and close together; glands of the fourth coxae located near suture lines between third and fourth coxae; genital field $101\mu \text{m}$ - $111\mu \text{m}$ in length, $126\mu \text{m}$ - $133\mu \text{m}$ in length, $126\mu\text{m}-133\mu\text{m}$ in width; gonopore long and narrow ($66\mu\text{m}-74\mu\text{m}$ in length, $12\mu \text{m}$ - $13\mu \text{m}$ in width); three pairs of genital acetabula; genital field flanked by two pairs of muscle attachment platelets; excretory pore located immediately posterior to the genital field; figure 224 shows the morphology of the venter; dorsal lengths of the palpal segments: P-I, $24\mu m-28\mu m$; P-II, $86\mu m-89\mu m$; P-III, 79μ m- 84μ m; P-IV, 109μ m- 113μ m; P-V, 47μ m- 51μ m; papillae extending well up medial surface of P-II and P-III; no ventral projection on P-II; figure 223 shows the proportions and chaetotaxy of the palp; capitulum $146\mu m$ - $148\mu m$ in length; chelicera $177\mu \text{m}$ - $185\mu \text{m}$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $120\mu \text{m}$ - $133\mu \text{m}$; I-Leg-5, $115\mu \text{m}$ - $133\mu \text{m}$; I-Leg-6, $96\mu \text{m}$ -118 μ m; structure of these segments as illustrated for the female; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $122\mu\text{m}$ - $140\mu\text{m}$; IV-Leg-5, 143 μ m-162 μ m; IV-Leg-6, 126 μ m-155 μ m; swimming hairs absent.

Female: Integument soft; dorsal and ventral plates and platelets smaller and more widely separated than in male; body $608\mu\text{m}-684\mu\text{m}$ in length; dorsum with a large anteromedial plate $304\mu\text{m}-399\mu\text{m}$ in length, $197\mu\text{m}-293\mu\text{m}$ in width; this plate bearing only the postocularia; other platelets and glandularia similar to male but the two smaller pairs of anterior glandularia and one pair of combined glandularia-muscle attachment platelet not fused with the large anterior plate (fig. 225); length between anterior end of first coxae and posterior end of genital field $517\mu\text{m}-608\mu\text{m}$; first coxae fused medially; capitular bay V-shaped; the epimeroglandularia l fused with second coxae; medial margins of posterior coxal groups much shorter than in male and well separated from each other; glands of

the fourth coxae located near suture lines between third and fourth coxae; genital field $167\mu\text{m}-192\mu\text{m}$ in width; length between anterior end of pregenital sclerite and posterior end of postgenital sclerite $133\mu\text{m}-162\mu\text{m}$; three pairs of genital acetabula; two pairs of muscle attachment platelets flanking the genital field; figure 227 illustrates the venter; dorsal lengths of the palpal segments: P-I, 27 $\mu\text{m}-31\mu\text{m}$; P-II, $90\mu\text{m}-116\mu\text{m}$; P-III, $90\mu\text{m}-107\mu\text{m}$; P-IV, $121\mu\text{m}-169\mu\text{m}$; P-V, $55\mu\text{m}-69\mu\text{m}$; capitulum $162\mu\text{m}-199\mu\text{m}$ in length; chelicera $192\mu\text{m}-214\mu\text{m}$ in length; figure 231 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $118\mu\text{m}-148\mu\text{m}$; I-Leg-5, $111\mu\text{m}-155\mu\text{m}$; I-Leg-6, $104\mu\text{m}-126\mu\text{m}$; figure 229 shows these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $122\mu\text{m}-159\mu\text{m}$; IV-Leg-5, $152\mu\text{m}-185\mu\text{m}$; IV-Leg-6, $141\mu\text{m}-164\mu\text{m}$; swimming hairs absent.

Material Examined: NORTH ISLAND: 1 of, 2 ♀, from a stream on Rt 12 at Kaihu (Northland), May 29, 1981; 5 \, Pohue Stream at Waiomu (Coromandel Peninsula), Oct. 26, 1982; 1, from Haparapara River, 4 km north of Omaio (East Cape District), Oct. 28, 1982; 1 ♂, 3 ♀, from stream at Owhiritoa Bridge, on Rt 2 in ''Gorge'' south of Opotiki, Oct. 29, 1982; 3 \(\sigma\), Mangamawhete Stream on Rt 3, between Inglewood and Stratford (Egmont area), Nov. 1, 1982; 3 \(\pi \), from headwaters of Whangamata Stream 10 km northwest of Taupo, Nov. 3, 1982; 1 %, 3 ♀, Otupoto Stream on Rt 32, west of Lake Taupo, Nov. 3, 1982; SOUTH ISLAND: 6 of, 23 ♀, Opouri River between Carluke and Opouri Valley on Tennyson Inlet Rd, Nov. 6, 1982; 12, Whangamoa River on Rt 6, 3 km northeast of Whangamoa Saddle (north of Nelson), Nov. 6, 1982; 1 of, 3 a, Little Hope River on Rt. 6, at bridge slightly southwest of Hope Saddle (near Glenhope), Nov. 7, 1982; 1 \, from the Whitehorse Creek on Rt. 6, south of Four Mile River (between towns of the same name), Nov. 8, 1982; 1 \, Wind Bag River on Rt. 6, between Lake Paringa and Lake Moeraki (north of Haast), Nov. 10, 1982; 12, Dunton Creek on Rt. 94, 85 km south of Milford Sound, Nov. 14, 1982; 3 \(\gamma\), 13 \(\gamma\), Shag River near its headwaters, on Rt 85, 2 km west of Pigroot Summit (Central Otago), Nov. 16, 1982; 2 9, 5 9, White Rock River (southwest of Timaru), where Cliffs Rd branches off Pareora-Cave Rd, Nov. 18, 1982; 8 of, 1 \, small creek on Rt. 6, approx. 10 km west of Havelock (northern South Island), Nov. 22, 1982; 2 ♀, Hope River on Rt 6, between Glenhope and Kawatiri, Nov. 25, 1982.

36. Zelandobates tornus, new species

(Figs. 203-209)

Male: Integument soft but with papillae; dorsal and ventral sclerites well developed and these also noticeably papillate; body $486\mu m$ ($471\mu m$ - $547\mu m$) in length; dorsum with a large anteromedial plate $247\mu m$ ($236\mu m$ - $262\mu m$) in length, $288\mu m$ ($274\mu m$ - $304\mu m$) in width; this plate bearing the postocularia and three pairs of glandularia; anterior plate with distinct ridges which are better illustrated (fig. 206) than described; none of the dorsal setae exceptionally long; antenniform setae on a common sclerite; one median and two lateral pairs of muscle attachment platelets in posterior portion of dorsum; length between anterior end of first coxae and posterior end of genital field $456\mu m$ ($440\mu m$ - $479\mu m$); the first coxae fused medially; capitular bay somewhat V-shaped; epimeroglandularia I fused with the second coxae; medial margins of posterior coxal groups relatively short and separated from each other medially; glands of the fourth coxae located near suture lines between third and fourth coxae; genital field Ill μm (118 μm -125 μm) in length, $141\mu m$ ($140\mu m$ - $145\mu m$) in width; gonopore long and narrow,

 $78\mu\text{m}$ ($74\mu\text{m}-85\mu\text{m}$) in length, approximately $25\mu\text{m}$ in width; a row of setae at anterior end of genital field; three pairs of genital acetabula, anterior pair well separated from the other two pairs; two pairs of muscle attachment platelets present in posterior half of venter; excretory pore near posterior end; figure 207 shows the morphology of the venter; dorsal lengths of the palpal segments: P-I, $22\mu\text{m}$ ($21\mu\text{m}-26\mu\text{m}$); P-II, $69\mu\text{m}$ ($64\mu\text{m}-73\mu\text{m}$); P-III, $74\mu\text{m}$ ($69\mu\text{m}-79\mu\text{m}$); P-IV, $83\mu\text{m}$ ($76\mu\text{m}-85\mu\text{m}$); P-V, $45\mu\text{m}$ ($40\mu\text{m}-42\mu\text{m}$); ventral side of P-II and P-III with numerous papillae; no projection on ventral side of P-II; capitulum $140\mu\text{m}$ ($137\mu\text{m}-162\mu\text{m}$) in length; chelicera $185\mu\text{m}$ ($178\mu\text{m}-200\mu\text{m}$) in length; figure 204 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $103\mu\text{m}$ ($89\mu\text{m}-103\mu\text{m}$); I-Leg-5, $104\mu\text{m}$ ($96\mu\text{m}-115\mu\text{m}$); I-Leg-6, $111\mu\text{m}$ ($103\mu\text{m}-118\mu\text{m}$); first leg as shown for the female; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $141\mu\text{m}$ ($126\mu\text{m}-148\mu\text{m}$); IV-Leg-5, $155\mu\text{m}$ ($141\mu\text{m}-162\mu\text{m}$); IV-Leg-6, $148\mu\text{m}$ ($133\mu\text{m}-182\mu\text{m}$); IV-Leg-5, $155\mu\text{m}$ ($141\mu\text{m}-162\mu\text{m}$); IV-Leg-6, $148\mu\text{m}$ ($133\mu\text{m}-182\mu\text{m}$); IV-Leg-5, $155\mu\text{m}$ ($141\mu\text{m}-162\mu\text{m}$); IV-Leg-6, $148\mu\text{m}$ ($133\mu\text{m}-182\mu\text{m}$); IV-Leg-5, $155\mu\text{m}$ ($141\mu\text{m}-162\mu\text{m}$); IV-Leg-6, $148\mu\text{m}$ ($133\mu\text{m}-182\mu\text{m}$); IV-Leg-6, $148\mu\text{m}$ ($1414\mu\text{m}-162\mu\text{m}$); IV-Leg-6, $148\mu\text{m}$ ($1414\mu\text{m}-162\mu\text{m}$); IV-Leg-6, $148\mu\text{m}$

148 μ m); swimming hairs absent.

Female: Integument soft and papillate; dorsal and ventral plates and platelets more widely separated than in male; body $668\mu m$ ($593\mu m$ - $623\mu m$) in length; dorsum with an anteromedial plate $247\mu\mathrm{m}$ ($228\mu\mathrm{m}$ - $273\mu\mathrm{m}$) in length, $258\mu\mathrm{m}$ $(258\mu\mathrm{m}-273\mu\mathrm{m})$ in width; this plate somewhat pointed posteriorly and bearing the postocularia; other plates and glandularia similar to male but two smaller pairs of anterior glandularia and one pair of combined glandularia-muscle attachment platelet not fused with anteromedial plate (fig. 205); length between anterior end of first coxae and posterior end of genital field $638\mu m$ ($547\mu m-593\mu m$); first coxae fused medially; capitular bay somewhat V-shaped; epimeroglandularia I fused with second coxae; medial margins of posterior coxal groups short and widely separated medially; glands of the fourth coxae located near suture lines between third and fourth coxae; genital field $192\mu m$ ($190\mu m$ - $194\mu m$) in width; length between anterior end of pregenital sclerite and posterior end of postgenital sclerite $148\mu m$ ($126\mu m$ - $141\mu m$); three pairs of genital acetabula; two pairs of muscle attachment platelets in posterior half of venter; posterior pair of these platelets relatively long and narrow; figure 208 illustrates the venter; dorsal lengths of the palpal segments: P-I, $26\mu\text{m}-34\mu\text{m}$; P-II, $98\mu\text{m}$ ($96\mu\text{m}$ -lll μm); P-III, $97\mu \text{m}$ ($96\mu \text{m}$ - $107\mu \text{m}$); P-IV, $112\mu \text{m}$ ($117\mu \text{m}$ - $124\mu \text{m}$); P-V, $50\mu \text{m}$ ($54\mu \text{m}$ -59μm); papillae extending well up medial sides of P-II and P-III; no ventral projection on P-II; figure 203 shows the proportions and chaetotaxy of the palp; the capitulum $177\mu\text{m}$ – $185\mu\text{m}$ in length; chelicera $222\mu\text{m}$ – $229\mu\text{m}$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $118\mu m$ ($121\mu m$ - $133\mu m$); I-Leg-5, $118\mu m$ ($120\mu m$ - $131\mu m$); I-Leg-6, $118\mu m$ ($120\mu m$ - $126\mu m$); figure 209 illustrates these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $155\mu m$ ($155\mu m$ - $167\mu m$); IV-Leg-5, $177\mu m$ ($179\mu m$ - $192\mu m$); IV-Leg-6, $170\mu \text{m}$ ($163\mu \text{m}$ - $180\mu \text{m}$); swimming hairs absent.

Holotype: Adult of, from Pohue Stream at Waiomu (Coromandel Peninsula),

North Island, Oct. 26, 1982.

Allotype: Adult 9, same data as holotype.

Paratypes: NORTH ISLAND: 6 of, 1 \, stream on Rt 12 at Kaihu (Northland), May 29, 1981; 1 of, Otupoto Stream on Rt 32, between Hingarae Rd and Waihaha Rd (west of Taupo), June 6, 1981; 1 \, Orauhora Stream on Rt 30, between Barryville and Benneydale, June 6, 1981; 1 \, from river at Broadwood in northern North Island, Oct. 21, 1982; 1 of, 1 \, from Waima River on Rt. 12, 7 km west of Taheke, Oct. 24, 1982; 4 of, 15 \, same data as holotype; 13 of, 22 \, Tapu River at Tapu (Coromandel Peninsula), Oct. 26, 1982; 4 of, 17 \, from Tapu River, 1 km east of Tapu (Coromandel Peninsula), Oct. 27, 1982; 1 \, from a tributary of the

Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), Oct. 27, 1982; 1 of, 1 of, Torere River at Torere on Rt. 35 north of Opotiki, Oct. 28, 1982; 1 of, stream at Owhiritoa Bridge, on Rt 2 in the "Gorge" south of Opotiki, Oct. 29, 1982; 1 of, from a stream at Omaukoro Bridge on Rt 2, in "Gorge" south of Opotiki, Oct. 29, 1982; SOUTH ISLAND: 4 of, from Dunton Creek on Rt 94, 85 km south of Milford Sound, Nov. 14, 1982.

<u>Discussion</u>: At first glance, the rugose surface of the dorsal and ventral plates and platelets of the present species contrasts so strongly with the smooth surfaces found in *crinitus* that the similarities might be overlooked. However, the dorsal and ventral sclerites are homologous in position as is their degree of fusion in the two sexes of the two species, and so they seem congeneric. Some of the differences separating the two species are the long dorsal setae in *crinitus* (figs. 225, 226) and distinct ridges on the anteromedial plate of *tornus*. Actually, the present species is most closely related to the following, *Z. clevatus*. See remarks under the latter.

37. Zelandobates clevatus, new species

(Figs. 210-213, 215, 216, 218, 605)

Male: Integument soft but with low papillae; dorsal and ventral sclerites well developed and these also noticeably papillate; dorsal and ventral sclerites less rugose than in the previous species; body $532\mu m$ ($464\mu m$ - $532\mu m$) in length; dorsum with a large anteromedial plate $282\mu m$ ($258\mu m$ - $304\mu m$) in length, 319 μm (289 μm -334 μm) in width; this plate bearing the postocularia and three pairs of glandularia; anterior plate lacking the well developed ridges characteristic of the previous species (fig. 605); none of the dorsal setae especially long; antenniform setae each on a separate base; one median and two pairs of lateral muscle attachment platelets in posterior half of dorsum; a pair of glandularia fused with posteromedial platelet (fig. 215); length between anterior end of first coxae and posterior end of genital field $502\mu m$ ($433\mu m-510\mu m$); first coxae fused medially; capitulular bay somewhat V-shaped; epimeroglandularia I fused with the second coxae; medial margins of posterior coxal groups of moderate length and relatively close together; glands of the fourth coxae located near suture lines between third and fourth coxae; genital field $104\mu m$ ($89\mu m$ - $100\mu m$) in length, 133 μm (126 μm -139 μm) in width; gonopore long and narrow, $74\mu m$ (60 μm - $74\mu m$) in length, $22\mu m$ (19 μm -24 μm) in width; a row of setae on each side anterior to the gonopore; three pairs of genital acetabula, these more or less evenly spaced on their respective sides; two pairs of muscle attachment platelets present in the posterior half of venter; excretory pore terminal; figure 210 shows the venter; dorsal lengths of the palpal segments: P-I, $21\mu m$ ($24\mu m$); P-II, $76\mu m$ ($72\mu m$ - $76\mu \text{m}$); P-III, $74\mu \text{m}$ ($71\mu \text{m} - 77\mu \text{m}$); P-IV, $91\mu \text{m}$ ($85\mu \text{m} - 87\mu \text{m}$); P-V, $43\mu \text{m}$ (45μm); ventral side of P-II and P-III with numerous papillae; no ventral projection on P-II; capitulum $152\mu m$ ($141\mu m$ - $155\mu m$) in length; chelicera $192\mu m$ ($170\mu m$ -192μm) in length; figure 213 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $118\mu m$ (104) μ m-122 μ m); I-Leg-5, 122 μ m (103 μ m-124 μ m); I-Leg-6, 122 μ m (108 μ m-127 μ m); these segments as illustrated for the female; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $155\mu m$ ($141\mu m$ - $152\mu m$); IV-Leg-5, $170\mu m$ $(155\mu \text{m}-170\mu \text{m})$; IV-Leg-6, $159\mu \text{m}$ $(143\mu \text{m}-155\mu \text{m})$; swimming hairs absent.

Female: Integument soft; dorsal and ventral plates and platelets more widely separated than in male; body $744\mu m$ (653 μm -730 μm) in length; dorsum with

an anteromedial plate $281\mu m$ ($236\mu m-304\mu m$) in length, $266\mu m$ ($251\mu m-304\mu m$) in width; this plate somewhat pointed, bearing the postocularia and with extremly low ridges; two pairs of glandularia platelets and one pair of combination glandularia-muscle attachment platelets flanking the anteromedial plate (these fused with the plate in the male); glandularia flanking the small posteromedial platelet not fused with it as in male (fig. 216); length between anterior end of the first coxae and posterior end of genital field $699\mu m$ ($608\mu m$ - $654\mu m$); first coxae fused medially; capitular bay somewhat U-shaped; epimeroglandularia l fused with the second coxae; medial margins of posterior coxal groups short and well separated medially; glands of the fourth coxae located near suture lines between third and fourth coxae; genital field $207\mu m$ ($199\mu m-229\mu m$) in width; length between anterior end of pregenital sclerite and posterior end of postgenital sclerite $177\mu m$ ($170\mu m$ - $185\mu m$); three pairs of genital acetabula; two pairs of muscle attachment platelets located in posterior portion of venter; posterior pair of these platelets relatively narrow; figure 211 illustrates the venter; dorsal lengths of the palpal segments: P-I, $28\mu m$ ($27\mu m-31\mu m$); P-II, $107\mu m$ ($100\mu m 111\mu m$); P-III, $107\mu m$ ($107\mu m$ - $110\mu m$); P-IV, $131\mu m$ ($133\mu m$ - $138\mu m$); P-V, $62\mu m$ $(61\mu \text{m}-62\mu \text{m})$; ventral papillae extending well up medial sides of P-II and P-III; no ventral projection on P-II; figure 212 shows a medial view of the palp; capitulum $192\mu m$ ($192\mu m$ – $214\mu m$) in length; chelicera $259\mu m$ ($236\mu m$ – $263\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $145\mu m$ (135 μm - $152\mu \text{m}$); I-Leg-5, $141\mu \text{m}$ ($128\mu \text{m}$ - $148\mu \text{m}$); I-Leg-6, $140\mu \text{m}$ ($133\mu \text{m}$ - $141\mu \text{m}$); figure 218 illustrates these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $177\mu \text{m}$ ($177\mu \text{m}$ -192 μm); IV-Leg-5, $196\mu \text{m}$ ($189\mu \text{m}$ -214 μm); IV-Leg-6, $189\mu m$ ($185\mu m$ - $192\mu m$); swimming hairs absent.

Holotype: Adult of, from the MacLennan River at bridge on Aurora Creek Rd (Catlin State Forest area), between Puketiro and Rt 92, South Island, Nov.

12, 1982.

Allotype: Adult 9, same data as holotype.

Paratypes: 14 \(\paratypes\), from a spring at the summit of Desert Road (at AA pullout) south of Lake Taupo, North Island, Nov. 4, 1982; 1 \(\sigma\), 2 \(\paratypes\), same data as holotype; 4 \(\paratypes\), from Boyd Creek on Rt. 94, 76 km south of Milford Sound, South Island, Nov. 14, 1982.

Discussion: The present species is closely related to the preceding species and the major differences are best shown by the males. The male anterodorsal plate of the present species is more octagonal and the ridges are much lower. The small posteromedial plate has a pair of glandularia fused with it in *clevatus*. There are also differences in the genital field with the acetabula more or less evenly placed in males of the present species. Females may be distinguished by the lack of darker integumental pigment, the presence of separate antenniform setae bases, and lower ridges on the dorsal sclerites in the present species (these differences are also found in males of the two species).

Genus ZELANDOBATELLA Hopkins

Diagnosis and Discussion: This genus shares with Zelandobates the major (although plesiomorphic) characteristics of a relatively unmodified male gonopore, all glandularia of the dorsum similar and no ventral projection on P-II. The differences separating Zelandobatella and Zelandobates are as follows: Postocularia are on separate platelets in the present genus. Although these might expand and fuse to form a condition similar to that of the preceding genus, the posteromedial sclerite is missing in Zelandobatella. There are three lateral

pairs of dorsalia in both genera, but the anterior pair in Zelandobatella is not fused with glandularia. The coxae are proportionally much smaller in the present genus and the first coxae are separated medially. The male gonopore shows some indication of widening in the present genus (fig. 219), but it is still proportionally much longer and narrower than in any of the South American or Australian Corticacarus-like mites. Appendages are rather similar in the two New Zealand genera but papillae are lacking on the ventral side of P-II in the present genus (fig. 214). An initial impression is that Zelandobatella is closer to the New World Paracorticacarus-like species and Zelandobates closer to the New World members of the typical subgenus. However, this almost certainly is the result of convergence, for the New World forms are all synapomorphic for the three major characters discussed in the introduction to the Corticacarus-like mites.

38. Zelandobatella naias Hopkins

(Figs. 214, 217, 219-222, 604)

Zelandobatella naias Hopkins, 1975. Jour. Royal Soc. New Zealand, 5:9.

Male: Integument soft, with characteristic large, slighly raised areas which are better illustrated (fig. 604) than described; length of body 479 µm-486 µm; dorsal sclerites consisting of small paired postocularia platelets and three pairs of small lateral sclerites (fig. 220); length between anterior end of first coxae and posterior end of genital field $342\mu m-350\mu m$; first coxae separated medially; epimeroglandularia I fused with the second coxae; medial margins of posterior coxal group short and widely separated medially; glands of the fourth coxae located near suture lines between third and fourth coxae; genital field 76µm-93µm in length, $100\mu\text{m}$ -lll μm in width; gonopore $52\mu\text{m}$ - $57\mu\text{m}$ in length, $26\mu\text{m}$ - $29\mu\text{m}$ in width; three pairs of genital acetabula; one pair of small muscle attachment platelets far laterally on venter (fig. 219); dorsal lengths of the palpal segments: P-I, $19\mu m-21\mu m$; P-II, $61\mu m-66\mu m$; P-III, $67\mu m-71\mu m$; P-IV, $81\mu m-88\mu m$; P-V, $43\mu \text{m}$ - $45\mu \text{m}$; papillae present only on P-III; figure 214 illustrates the proportions and chaetotaxy of the palp; capitulum 123 \mu m-137 \mu m in length; chelicera $133\mu\mathrm{m}$ - $141\mu\mathrm{m}$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $81\mu\text{m}-92\mu\text{m}$; I-Leg-5, $81\mu\text{m}-94\mu\text{m}$; I-Leg-6, $83\mu\text{m}-91\mu\text{m}$; these segments as shown for the female; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $108\mu\text{m}$ - $125\mu\text{m}$; IV-Leg-5, $104\mu\text{m}$ - $125\mu\text{m}$; IV-Leg-6, $107\mu\text{m}$ - $118\mu\text{m}$; swimming hairs absent.

Female: Integument as described and shown for male; length of body $502\mu\text{m}-577\mu\text{m}$; dorsal sclerites as described and illustrated for male; length between anterior end of first coxae and posterior end of genital field $440\mu\text{m}-509\mu\text{m}$; the venter, except for genital field region, as described for male; genital field 189 $\mu\text{m}-200\mu\text{m}$ in width; length between anterior end of pregenital sclerite and posterior end of postgenital sclerite $133\mu\text{m}-162\mu\text{m}$; three pairs of genital acetabula; figure 222 shows the structure of the venter; dorsal lengths of the palpal segments: P-I, $18\mu\text{m}-24\mu\text{m}$; P-II, $83\mu\text{m}-100\mu\text{m}$; P-III, $87\mu\text{m}-104\mu\text{m}$; P-IV, $111\mu\text{m}-130\mu\text{m}$; P-V, $50\mu\text{m}-58\mu\text{m}$; ventral side of P-III with a few papillae; capitulum $151\mu\text{m}-192\mu\text{m}$ in length; chelicera $166\mu\text{m}-225\mu\text{m}$ in length; figure 221 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $96\mu\text{m}-118\mu\text{m}$; I-Leg-5, $100\mu\text{m}-115\mu\text{m}$; I-Leg-6, $94\mu\text{m}-106\mu\text{m}$; figure 217 shows these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $130\mu\text{m}-155\mu\text{m}$; IV-Leg-5, $131\mu\text{m}-155\mu\text{m}$; IV-

Leg-6, $134\mu\text{m}$ - $154\mu\text{m}$; swimming hairs absent.

Material Examined: NORTH ISLAND: $2 \, \circ'$, $1 \, \circ$, Te Whaiau Stream at junction of Rt 47 and Rotoaria Rd, June 5, 1981; SOUTH ISLAND: $2 \, \circ'$, $1 \, \circ$, from a tributary of the Whangamoa River on Rt 6, slightly west of Rai Saddle (at Collins Valley Picnic Grounds), Nov. 6, 1982; $36 \, \circ$, from mosses in a small waterfall seepage entering Graham Stream, on Rt 6 at picnic grounds 8 km northeast of Whangamoa Saddle, Nov. 6, 1982; $4 \, \circ$, tributary of the Motupiko River on Rt 6, between Korere and Glenhope, Nov. 7, 1982; $1 \, \circ'$, Kararoa Creek on Rt. 6, between Barrytown and Nine Mile Village, Nov. 8, 1982; $3 \, \circ$, from Rocky Gully Stream on Rt 8, between Cave and Fairlie (west of Timaru), Nov. 18, 1982; $1 \, \circ$, Kaituna River on Rt 6, 5 km south of Havelock, Nov. 22, 1982; $1 \, \circ'$, $3 \, \circ$, from a small creek on Rt 6, approx. 10 km west of Havelock, Nov. 22, 1982.

Family PIONIDAE Thor

Genus PIONA Koch

39. Piona exigua Viets

(Figs. 228, 230, 232-235)

Piona uncata exigua Viets, 1949. Abh. naturw. Ver. Bremen, 32: 322. Piona novae-zealandiae Stout, 1953. Trans. Royal Soc. New Zealand, 81: 433.

Male: Length of body approximately $623\mu m$; length between anterior end of first coxae and posterior end of genital field 570 µm; first coxae separated and with short medial margins; epimeroglandularia l free; tips of first coxae not extending anterior to the capitulum; posterior coxal groups fused medially; suture lines between third and fourth coxae incomplete but extending nearly to median coxal margins; posterior apodemes of anterior coxal groups short; posterior corners of fourth coxae projecting and these projections nearly touching the genital field; genital field broadly fused with the fourth coxae; genital field extending laterally beyond projections of fourth coxae; genital field 318µm in width; a well developed genital pit present immediately posterior to the gonopore, width of this pit 125µm; 12-14 genital acetabula on each side; epimeroglandularia 2 free; figure 235 illustrates the venter; dorsal lengths of the palpal segments: P-I, 44 μ m; P-II, 174 μ m; P-III, 76 μ m; P-IV, 192 μ m; P-V, 91 μ m; two well developed setal tubercles on ventral side of P-IV; peg-like seta of P-IV distoventral; figure 232 shows the proportions and chaetotaxy of the palp; capitulum including the anchoral process $185\mu m$ in length, $162\mu m$ in width; chelicera $236\mu m$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 199μm; I-Leg-5, $238\mu m$; I-Leg-6, $207\mu m$; figure 234 shows I-Leg-5 and 6; dorsal lengths of the distal segments of the third leg: III-Leg-4, 185 \mu m; III-Leg-5, 288 \mu m; III-Leg-6, $140\mu\mathrm{m}$; III-Leg-6 expanded distally; a patch of short swimming hairs near the distal end of III-Leg-5; modification of the claws of the third leg better illustrated (fig. 233) than described; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $200\mu m$; IV-Leg-5, $273\mu m$; IV-Leg-6, $229\mu m$; a group of stiff swimming hairs at distal end of IV-Leg-5; figure 230 shows the modification of IV-Leg-4.

Female: See Stout (1953b).

Material Examined: 1, Lake Ianthe, on Rt 6, between Pukekura and Evans Creek, Nov. 9, 1982.

Discussion: This New Zealand mite was originally described as a subspecies of uncata but, when one examines the differences in male genital fields and considers the very disjuct distribution, it seems far more likely exigua should stand as a distinct species. Actually, P. exigua seems most closely related to the Australian species, P. uncatiformis, described by Lundblad (1947). The most noticeable difference between the two Australasian species is the proportionally wider genital pit and less laterally extending acetabular plates in males of the Australian species. The genital field only extends to the projections of the fourth coxae in uncatiformis, not well beyond them as in the present species (fig. 235). Although the uncata-like species of Piona are primarily holarctic, a member of the group, P. pseudouncata, was described by Piersig (1906) from Java. Although pseudouncata and exigua differ in morphology of the claws of the third leg, the two are sufficiently alike that Walter (1929) listed material sent to him from the Christchurch area of New Zealand (and very likely is actually exigua) as Piersig's species. It seems almost certain that members of this highly vagile species group of Piona have dispersed southwards into both New Zealand and Australia

Family ATURIDAE Thor

Subfamily NOTOATURINAE Besch

Members of this austral subfamily are the only aturids presently known from New Zealand. However, they have undergone extensive evolution into many distinctive genera, and make up approximately one-half of the stream inhabiting species of the islands. Based on present knowledge of the notoaturin faunas of New Zealand, Australia, austral South America and southern Africa (unfortunately, members of the subfamily from the latter two regions are still very poorly known), each of these former Gondwanan areas contains a distinctive group. Noticeable differences are found in the number of dorsal sclerites and numer of glandularia associated with the dorsal shield, and these seem to be relatively stable for the species living in each of the four areas. The discussions and diagnoses given below are by region in which the notoaturins occur.

SOUTHERN AFRICA: Two species assigned to the genus *Masabania* were collected in the Mt. Elgon region on the border between Kenya and Uganda. Although these are the only African notoaturins presently known, it is almost certain that additional species occur farther south. *Masabania* possesses an undivided anteromedial plate and an undivided posteromedial plate. These are flanked by three pairs of small lateral platelets, each of which bears a glandularium. The posteromedial plate bears one pair of glandularia bringing the number of dorsal glandularia to four pairs. Glands are absent on the fourth coxae as are projections associated with the openings for insertion of the fourth legs. These two structures are present in notoaturins from the other three land areas.

SOUTH AMERICA: One specimen of *Notoaturus*, *N. leptoglyphus* Besch, has been collected in austral Chile and is the only undoubted notoaturin so far collected in the New World. I examined Besch's slide preparation many years ago at a time when I did not know what to look for in the way of arrangement of the dorsal glandularia. It is very difficult to see the glandularia in the rugose integument of this Chilean species and am suspicious of the arrangement of these structures as illustrated by both Besch (1964) and Cook (1974). However, the very distinctive arrangement of the dorsal sclerites can be described. The anteromedial plate is divided into separate right and left parts. The posteromedi-

al plate is entire and there are two pairs of rather large lateral platelets. A pair of free glandularia sclerites (as commonly found in the New Zealand species) are present but, unlike their position in the New Zealand forms, they are close together medially anterior to the posteromedial plate in *Notoaturus*. I mentioned that *Notoaturus* was the only undoubted notoaturin presently known from South America. However, if one disregards the fact that it bears only four pairs of acetabula arranged in an "axonopsin" fashion, and looks instead at the arrangement of the plates and platelets of the dorsum, the austral genus and species Notaxona ochiepus Besch seems to be closely related to, if not actually a member of, the subfamily Notoaturinae.

AUSTRALIA: One species each in two genera, Austraturus tumidipalpis and Barwontius inflatipalpis, described by Kurt O. Viets (1978a, 1978b), are now listed from Australia, but at least 25 species are now known to occur there. All of the notoaturins of this continent have six pairs of glandularia associated with the dorsal shield, three pairs on the posteromedial plate, two pairs on the anterolateral platelet and one pair on the posterolateral platelets. The anteromedial plate is usually divided into right and left portions but in one unusual

undescribed interstitial genus the anteromedial plate is entire.

NEW ZEALAND: Forty five species are presently known, most of which are treated in this paper. There are a constant number of plates and platelets on the dorsum; a single anteromedial plate, a single posteromedial plate and two pairs of lateral platelets. There are typically four pairs of glandularia associated with the dorsal shield but these can be variable in how they fuse with the dorsal sclerites. Most commonly there are a pair of glandularia on the anterolateral platelets, a pair on small sclerites lying free in the integument between the lateral platelets and the posteromedial plate (and here termed glandularia 2), and two pairs of glandularia on the posteromedial plate (fig. 254). However, these "free" glandularia may fuse with the anteriolateral platelets (fig. 236), fuse with the posterolateral platelets (fig. 500), fuse with the posteromedial plate (fig. 289) or disappear (fig. 343).

The New Zealand notoaturins are extremely varied and appear to be the end products of an evolutionary radiation which has left few intermediates. Although most of the species can be placed in groups of related genera based on synapomorphisms, the relationships of these groups to each other is presently unclear. I believe an examination of all extant notoaturins, especially additional material from southern Africa, will be necessary in order to determine what is primitive and what is derived in the major notoaturin groups. For the New Zealand members of the subfamily, however, it is tempting to speculate that a condition in which there are a pair of "free" glandularia on the dorsum is plesiomorphic. It is easiest to derive the other arrangements of the dorsal glandularia from this condition. Also, the austral South American genus Notoaturus exhibits a similar set of "free" glandularia and one of the three lateral glandularia pairs in the African Masabania is likely its homolog.

Photographs of the dorsal shields are included for most of the New Zealand species. As the dorsal shield is convex, it is not possible to bring all areas into sharp focus at the same time. Also, certain surface features are important as well as those deeper in the integument. For these reasons, each photo is taken at a level which best illustrates the maximum number of taxonomically important characters and these characters often appear in only a limited area of the photograph, even though they are actually present over the entire dorsal shield. For example, the entire outer surface of the dorsal shield of Taintaturus abditus is reticulate as shown only around the periphery in the photograph (fig. 563).

The entire dorsal shield will appear papillate, as in the center of the photo, as on focuses deeper into the integument. Rarely will a photograph adequately show the position of the postocularia and dorsal glandularia, and drawings of the dorsal shields are also included.

I did not recollect two of the cave stream inhabiting species described by Imamura (1977, 1978) and did not have a chance to see the types. The major characters of one of these, *Zelandopsis movimotoi*, are included in the generic key. The other species not seen is *Zelandalbia hopkinsi*. However, a second species of this genus is described in the present paper and the differences which separate the two are discussed.

It should be mentioned that for many of the New Zealand notoaturins, P-IV is dorsoventrally flattened and is much wider than high. The result is that a slight variation in the orientation of the palp on a slide will result in a great variation in the apparent height of this segment.

The following generic key is constructed so as to include, to the degree possible, characteristics which will key out both males and females. However, sexual dimorphism of the male body or appendages is often an important genric character, and these are included as suppliments in the couplets.

KEY TO THE NEW ZEALAND GENERA AND SUBGENERA OF NOTOATURINAE

1.	IV-Leg-2 longer than other segments of the leg; IV-Leg-3 very small, partially covered by IV-Leg-2, reduced nearly to a point ventrally and this point bearing two setae (figs. 247, 264); anteromedial portion of ventral shield typically produced into a hood covering the capitular bay (figs. 249, 261), but in one species (fig. 286) this hood is greatly reduced
2.	Glandularia 2 of dorsum on small sclerites lying free in the integument (fig. 261)
3.	IV-Leg-2 laterally compressed but expanded dorsoventrally, and generally covering ventral projection of IV-Leg-3 (figs. 260, 264); anteromedial projection on dorsal side of ventral shield well developed (fig. 261); palpal segments relatively short

4.	Very large, pointed projections associated with openings for insertion of fourth legs (fig. 276); capitulum much longer than high (fig. 282) and attached to a tube of soft integument to produce protrusible mouth parts Genus Abelaturus, new genus (p. 61) Projections associated with openings for insertion of fourth legs much smaller (figs. 257, 273); capitulum only slightly longer than high (fig. 262) and not protrusible Genus Taintaturus, new genus (p. 55)
5.	Glandularia 2 of dorsum fused with the anterolateral platelets (figs. 425, 428)
6.	Males with a cauda and the posteromedial plate is highly modified (figs. 425, 433); fourth leg of male exhibiting sexual dimorphism (fig. 444) Subgenus Caudaturus, new subgenus (p. 95) Males without a cauda and posteromedial plate is unmodified; no pronounced sexual dimorphism of male fourth leg Subgenus Kritaturus
7.	Glandularia 2 of dorsum fused with posteromedial plate (i.e., there are three pairs of glandularia on this platefigure 289) Genus Tryssaturopsis Cook(p. 64) Glandularia 2 variable in position but not present on posteromedial plate (i.e., this plate bears two pairs of glandularia)
8.	Anteromedial plate only slightly more than one-fourth as long as posteromedial plate; male gonopore located far forward on the body; genital acetabula described as being absent Genus Zelandopsis Imamura Anteromedial plate more than one-half as long as posteromedial plate; male gonopore more nearly terminal (figs. 388, 410);
9.	genital acetabula present
	characters given above

10.	Glandularia either present on the posterolateral platelets (fig. 500) or, if absent, there are large setae on these platelets which are the homologs of the glandularia (figs. 485, 490); dorsum relatively smooth (figs. 600, 601)
11.	Gland portion of glandularia present on posterolateral platelets (fig. 500); leg segments laterally compressed but dorsoventrally expanded (figs. 503, 505); insertions of fourth legs well medial to lateral edge of ventral shield (fig. 501) Genus Zelandalbia Imamura(p. 111) Gland portion of glandularia absent on posterolateral platelets (fig. 485); leg segments not noticeably expanded or compressed; fourth legs inserted laterally (fig. 482) Genus Uralbia Hopkins(p. 107)
12.	Anterodorsal portion of ventral shield tapering to a well developed medial point (figs. 418, 421); openings for insertion of fourth legs with broad, truncate projections (figs. 410, 416); excretory pore ventral in position; male IV-Leg-5 expanded distally but not extending far beyond insertions of IV-Leg-6 (figs. 407, 426) Genus Paratryssaturus Imamura (p. 90) Anterodorsal portion of ventral shield generally more or less truncate medially (fig. 376) or actually indented (fig. 308); (Note: do not confuse dorsal portion of ventral shield with the projecting roof of the camerostome. Figure 403 illustrates a more or less truncate anterodorsal portion of the ventral shield and a decidedly pointed roof of the camerostome); If anterodorsal portion of ventral shield is slighly pointed medially (fig. 360), the excretory pore is terminal or dorsal
13.	Posterior suture lines of fourth coxae extending decidedly posteromedially (figs. 309, 313); glands of the fourth coxae greatly reduced in size; postocularia and all four pairs of glandularia of the dorsum on well developed tubercles (fig. 308) Genus Pilosaturus, new genus(p. 69) Posterior suture lines of fourth coxae extending more or less at right angles to long axis of body (figs. 316, 320) or slightly anteromedially (fig. 318); glands of the fourth coxae not reduced in size; postocularia and the four pairs of dorsal glandularia not all on tubercles
14.	IV-Leg-1 shorter than IV-Leg-2; distinct intercoxal slots for legs present (figs. 358, 361); P-IV bulging ventrally, P-II with sharp-pointed papillae ventrally (figs. 351, 359); edges of projections associated with insertions of fourth legs without several setae on them (fig. 349)

Genus PLANATURUS, new genus

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets bearing two pairs of glandularia and posteromedial plate bearing two pairs of glandularia; integument smooth (fig. 561); anterodorsal portion of ventral shield produced into a well developed hood which is more or less truncate anteriorly (fig. 236); a pair of glandularia immediately medial to insertions of the fourth legs; no pronounced sexual dimorphism of the legs; leg segments laterally compressed and high dorsoventrally; intercoxal slots present to house portions of these leg segments; IV-Leg-2 the longest segment of the fourth leg; IV-Leg-3 short, partially covered by IV-Leg-2 and its ventral portion reduced to an angle bearing two setae (fig. 247); projections associated with insertions of fourth legs relatively broad; P-IV wider than high (figs. 244, 250).

Type Species: Planaturus setipalpis, new species.

Discussion: The proximal portion of IV-Leg-l is constricted and then widens out again at very end as shown in figure 255 for members of the present genus and the following three, *Taintaturus*, *Abelaturus* and *Omegaturus*. When the leg is removed it nearly always breaks at the point of constriction and, for this reason, true length measurements of this segment are nearly impossible to obtain.

Planaturus, along with the three genera mentioned in the above paragraph, form a natural genus group characterized by the tendency for IV-Leg-2 to become lengthened, laterally compressed and dorsoventrally expanded. IV-Leg-3 is reduced ventrally to more or less an angle bearing two setae (fig. 247). These characters are without doubt synapomorphic for this genus group. In Omegaturus, IV-Leg-2 is closer to the ancestral condition for the group (fig. 287) with little expansion or compression but IV-Leg-3 is typical for the group. Other characteristics are a tendency to form a hood at the anterior end of the dorsal

side of the ventral shield. Again, *Omegaturus* seems to be at the beginning of a transformation series in which the hood ranges from only slightly developed to well developed in the genera *Planaturus* and *Taintaturus*, especially in the former (figs. 236, 241). Other shared characteristics are a pair of glandularia located slightly posteromedial to the insertions of the fourth legs and well developed intercoxal slots. What appear to be the most primitive of these four genera based on the characters listed above, *Omegaturus* and *Abelaturus*, exhibit the most highly modified mouthparts, but this is likely a derived condition.

The fusion of the "free" glandularia with the anterolateral platelets will easily separate the present genus from other members of its group.

40. Planaturus setipalpis, new species

(Figs. 236-243, 561)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 502 μm (516 μm -547 μm) in length, 380 μm (349 μm -395 μm) in width; anteromedial plate bearing the postocularia; anterolateral platelets with two pairs of glandularia and the posteromedial plate bearing two pairs of glandularia; anterodorsal portion of ventral shield forming a broad projecting hood; integument smooth and with small pores (figure 561); figure 236 illustrates a dorsal view of the body; ventral shield $714\mu m$ ($729\mu m$ - $745\mu m$) in length, $456\mu m$ ($441\mu m$ - $500\mu m$) in width; second and third coxae pointed and somewhat projecting; intercoxal slots present between first and second coxae, second and third coxae and third and fourth coxae; projections associated with insertions of fourth legs relatively wide; a pair of glandularia located immediately medial to these projections; male gonopore small and nearly terminal; numerous small setae surrounding gonopore; ventral shield with a projection posterior to the gonopore; several pairs of genital acetabula present; dorsal lengths of the palpal segments: P-I, $13\mu m$ ($13\mu m$ - $16\mu \text{m}$); P-II, $28\mu \text{m}$ ($27\mu \text{m}$ - $29\mu \text{m}$); P-III, $29\mu \text{m}$ ($26\mu \text{m}$ - $31\mu \text{m}$); P-IV, $36\mu \text{m}$ ($36\mu \text{m}$); P-IV, $36\mu \text{m}$); P-IV, $36\mu \text{m}$ ($36\mu \text{m}$); P-IV, $36\mu \text{m}$); P-IV, $36\mu \text{m}$ ($36\mu \text{m}$); P-IV, $36\mu \text{m}$); P-IV, $36\mu \text{m}$ ($36\mu \text{m}$); P-IV, $36\mu \text{m}$); P-IV, $36\mu \text{m}$ ($36\mu \text{m}$); P-IV, μ m-38 μ m); P-V, 17 μ m; P-II noticeably humped dorsally and bearing a medial thickened seta approximately $50\mu m$ in length (fig. 238); capitulum $86\mu m$ ($80\mu m$ -86µm) in length; anterodorsal portion of capitulum blunt and only slightly projecting; chelicera $86\mu m$ ($79\mu m-83\mu m$) in length; all distal leg segments tending to be high and laterally compressed; dorsal lengths of the distal segments of the first leg: I-Leg-4, $45\mu m$ ($42\mu m$ - $46\mu m$); I-Leg-5, $41\mu m$ ($41\mu m$ - $42\mu m$); I-Leg-6, $36\mu \text{m}$ ($38\mu \text{m}$ - $41\mu \text{m}$); height of I-Leg-5, $29\mu \text{m}$ ($30\mu \text{m}$ - $31\mu \text{m}$); proportions of these segments as illustrated for the female; dorsal lengths of the segments of the fourth leg: IV-Leg-2, $62\mu m$ ($62\mu m$ - $76\mu m$); IV-Leg-3, $24\mu m$ ($26\mu m$ - $28\mu m$); IV-Leg-4, $35\mu m$ ($36\mu m-37\mu m$); IV-Leg-5, $35\mu m$ ($33\mu m-36\mu m$); IV-Leg-6, $52\mu m$ $(45\mu \text{m}-50\mu \text{m})$; greatest height of IV-Leg-2, $41\mu \text{m}$ $(40\mu \text{m}-43\mu \text{m})$; swimming hairs absent.

Female: Dorsum as described for the male; dorsal shield $562\mu m$ ($532\mu m$ – $577\mu m$) in length, $380\mu m$ ($364\mu m$ – $410\mu m$) in width; ventral shield $744\mu m$ ($715\mu m$ – $775\mu m$) in length, $441\mu m$ ($426\mu m$ – $486\mu m$) in width; except for genital field area, ventral shield as described for male, although tending to be proportionally somewhat narrower; gonopore terminal (fig. 241); female lacks the medial projection at posterior end of ventral shield; dorsal lengths of the palpal segments: P-I, $12\mu m$ ($13\mu m$ – $14\mu m$); P-II, $29\mu m$ ($28\mu m$ – $33\mu m$); P-III, $22\mu m$ ($23\mu m$ – $26\mu m$); P-IV, $34\mu m$ ($33\mu m$ – $35\mu m$); P-V, $17\mu m$; P-II not as humped dorsally and medial seta not as expanded as in male (fig. 240); capitulum $76\mu m$ ($72\mu m$ – $83\mu m$) in length; chelicera $79\mu m$ ($83\mu m$ – $89\mu m$) in length; figure 242 shows the structure

of the capitulum and chelicera; legs not exhibiting sexual dimorphism and are as described for the male; dorsal lengths of the distal segments of the first leg: I-Leg-4, $38\mu m$ ($35\mu m$ - $37\mu m$); I-Leg-5, $36\mu m$ ($36\mu m$ - $39\mu m$); I-Leg-6, $38\mu m$ ($36\mu m$ - $38\mu m$); figure 237 shows the distal segments of the first leg; the dorsal lengths of the segments of the fourth leg: IV-Leg-2, $65\mu m$ ($62\mu m$ - $65\mu m$); IV-Leg-3, $27\mu m$ ($24\mu m$ - $26\mu m$); IV-Leg-4, $31\mu m$ ($31\mu m$ - $33\mu m$); IV-Leg-5, $31\mu m$ ($30\mu m$ - $31\mu m$); IV-Leg-6, $41\mu m$ ($41\mu m$ - $44\mu m$); greatest height of IV-Leg-2, $34\mu m$ ($31\mu m$ - $35\mu m$); swimming hairs absent.

Holotype: Adult of, headwaters of Whangamata Stream, 10 km northwest of

of Taupo, North Island, Nov. 3, 1982.

Allotype: Adult \mathcal{L} , same data as holotype.

Paratypes: 1 of, 1 \(\), same data as holotype; SOUTH ISLAND: 9 of, 6 \(\), from a trubutary of the Wakamarina River 7 km southeast of Canvastown (off Rt 6), Nov. 5, 1982; 5 \(\), Oaro River at Oaro, on Rt 1 approx. 20 km south of Kaikoura, Nov. 19, 1982; 3 \(\), Pariwhakaoho River on Rt 60, 14 km northwest of Takaka, Nov. 24, 1982.

Discussion: As there are only two known species in this genus, no key is given. See remarks under the following species for characteristics which will separate the two.

41. Planaturus lundbladi, new species

(Figs. 244-251)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 570 μm (540 μm -608 μm) in length, 410 μm (388 μm -471 μm) in width; anteromedial plate bearing the postocularia; anterolateral platelets with two pairs of glandularia and the posteromedial plate with two pairs of glandularia; dorsal sclerites smooth and with small pores as shown for the preceding species (fig. 561); anteromedial portion of ventral shield forming a broad, projecting hood; ventral shield $775\mu\mathrm{m}$ ($782\mu\mathrm{m}$ - $851\mu\mathrm{m}$) in length, $532\mu\mathrm{m}$ ($536\mu\mathrm{m}$ - $592\mu\mathrm{m}$) in width; second and third coxae pointed and somewhat projecting; intercoxal slots present; projections associated with insertions of fourth legs relatively wide; a pair of glandularia located medial to these projections; gonopore small and terminal; a medially located group of small setae extending anteriorly from gonopore (fig. 251); no medial projection present posterior to gonopore; several genital acetabula present on each side; dorsal lengths of the palpal segments: P-I, $14\mu m$ ($15\mu m$ - $17\mu \text{m}$); P-II, $31\mu \text{m}$ ($32\mu \text{m} - 34\mu \text{m}$); P-III, $24\mu \text{m}$ ($25\mu \text{m} - 29\mu \text{m}$); P-IV, $41\mu \text{m}$ (40 μ m-42 μ m); P-V, 17 μ m (17 μ m-18 μ m); P-II noticeably humped dorsally; none of the setae of P-II greatly lengthened or expanded (fig. 244); capitulum $97\mu m$ (104) μ m-107 μ m) in length; anterodorsal portion of capitulum with a pronounced projection (fig. 246); chelicera $93\mu m$ ($93\mu m$ - $97\mu m$) in length; all the distal leg segments tending to be high and laterally compressed; dorsal lengths of the distal segments of the first leg: I-Leg-4, $45\mu m$ ($44\mu m$ - $45\mu m$); I-Leg-5, $40\mu m$ ($41\mu m$ - $42\mu m$); I-Leg-6, $41\mu m$ ($41\mu m$ - $44\mu m$); greatest height of I-Leg-5, $28\mu m$ ($29\mu m$ - $31\mu m$); dorsal lengths of the segments of the fourth leg: IV-Leg-2, $76\mu m$ ($83\mu m$ - $86\mu m$); IV-Leg-3, $35\mu m$ ($34\mu m$ - $36\mu m$); IV-Leg-4, $37\mu m$ ($39\mu m$ - $41\mu m$); IV-Leg-5, $35\mu m$ ($36\mu m - 38\mu m$); IV-Leg-6, $51\mu m$ ($51\mu m - 52\mu m$); greatest height of IV-Leg-2, $48\mu m$ ($51\mu m$ - $55\mu m$); figure 247 illustrates the proportions and chaetotaxy of the fourth leg.

Female: Dorsum as described for male; dorsal shield $532\mu m$ in length, 380 μm in width; ventral shield $744\mu m$ in length, $471\mu m$ in width; except for genital

field area, ventral shield as described for male, but not as narrowed in posterior half; gonopore terminal (fig. 248); a few genital acetabula on each side; dorsal lengths of the palpal segments: P-I, $14\mu m$; P-II, $31\mu m$; P-III, $23\mu m$; P-IV, $35\mu m$; P-V, $16\mu m$; P-II not as humped dorsally as in male (fig. 245); capitulum $83\mu m$ in length and with an anterodorsal protuberance as in male; chelicera $97\mu m$ in length; legs not exhibiting sexual dimorphism and as described and illustrated for male; dorsal lengths of the distal segments of the first leg: I-Leg-4, $35\mu m$; I-Leg-5, $36\mu m$; I-Leg-6, $36\mu m$; greatest height of I-Leg-5, $24\mu m$; structure of first leg similar to that shown for the related species (fig. 237); dorsal lengths of the segments of the fourth leg: IV-Leg-2, $62\mu m$; IV-Leg-3, $27\mu m$; IV-Leg-4, $30\mu m$; IV-Leg-5, $31\mu m$; IV-Leg-6, $43\mu m$; greatest height of IV-Leg-2, $39\mu m$.

Holotype: Adult o, from a stream on Wainui Rd, 5 km west of Mahinepua

Rd, northern North Island, Oct. 22, 1982

Allotype: Adult \(\begin{aligned} \text{, same data as holotype.} \end{aligned} \)

Paratypes: NORTH ISLAND: 5 of, from Waima River on Rt. 12, 7 km west of Taheke, Oct. 24, 1982; 1 of, from a stream at Twin Bridges, near Nukuta-whiti, May 30, 1981.

<u>Discussion</u>: The present species differs from *P. setipalpis* in lacking the enlarged setae on P-II (compare figures 238, 240 with figures 244, 245) and the protuberance on the distodorsal portion of the capitulum is more pointed (compare figures 242, 246). In addition, males of *lundbladi* lack a medial projection posterior to the gonopore but do have a group of small setae extending anterior to the gonopore (compare figures 243, 251).

Genus TAINTATURUS, new genus

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets bearing one pair of glandularia; a pair of very small glandularia sclerites between medial corners of the anterolateral and posterolateral platelets and the lateral edge of posteromedial plate; posteromedial plate bearing two pairs of glandularia; dorsal sclerites variously reticulate or irregularly lined (figs. 562-565); anterodorsal portion of ventral shield produced into a somewhat pointed hood which generally does not extend anteriorly as far as tips of coxae; coxal slots well developed; projections associated with insertions of fourth legs truncate and of moderate size (figs. 266, 269); a pair of glandularia located immediately medial to insertions of fourth legs; no pronounced sexual dimorphism of the legs; leg segments laterally compressed and high dorsoventrally; IV-Leg-2 is largest segment of fourth leg; IV-Leg-3 short, partially covered by IV-Leg-2 and its ventral portion reduced to a median angle bearing two setae (fig. 255); capitulum with an anchoral process and is not protrusible; P-IV wider than high (this means that only a slight difference in orientation of palp on slide will result in great apparent variations in height of segment).

Type Species: Taintaturus hopkinsi, new species.

Discussion: The present genus is most closely related to *Planaturus* but differs in having a pair of ''free'' glandularia on the dorsum, a less well developed anterodorsal hood and the integument tends to be more rugose. In some of the species the integument may be so irregular that the genital acetabula are difficult to see. Figure 266 shows what could be discerned from an examination of several individuals mounted on slides. However, a scanning EM photograph in posterior view (fig. 602) shows there are generally three rows of acetabula. Note that the pore plates are so deep, and cavities lacking pore plates so similar to those that do have them, that most acetabula cannot be determined with

certainty in ventral view.

KEY TO THE NEW ZEALAND SPECIES OF TAINTATURUS

1.	Anteromedial and posteromedial plates with numerous pores but no obvious reticulate ornamentation (fig. 565) Taintaturus projectus, new species(p. 60) Anteromedial and posteromedial plates with a distinct reticulate pattern (figs. 562-564)
2.	Projections associated with insertions of fourth legs moderately wide, with the lateral margins gradually tapering (figs. 266, 268); ornamentation of dorsal sclerites consisting of reticulations on surface and a stellate appearance deeper into the integument (fig. 562); IV-Leg-2 very high (fig. 264); male gonopore simple (fig. 268)
3.	Male genital field with a small median pit partially covered by a posteriorly directed projection located anterior to the gonopore (fig. 252)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield $319\mu m$ ($289\mu m$ - $319\mu m$) in length, $243\mu m$ ($243\mu m$ - $274\mu m$) in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; one pair of glandularia on small sclerites lying free; posteromedial plate with two pairs of glandularia; ornamentation of the dorsal shield consisting of surface reticulations which are not arranged in rows and deeper portions of integument appearing stellate (fig. 562); anteromedial portion of ventral shield forming a somewhat truncate hood which does not project as far forward as tips of coxae (fig. 265); ventral shield $449\mu m$ (388 μm -471 μm) in length, 278 μm (278 μ m-297 μ m) in width; second and third coxae somewhat pointed; well developed intercoxal slots present; anterolateral corners of ventral shield exhibit varying degreed of development of anterior projections (fig. 268), but absent in some individuals; projections associated with insertions of fourth legs relatively wide, the outer margins tapering; a pair of glands located medial to these projections; gonopore small, subterminal and flanked by a few setae (fig. 268); a few genital acetabula on each side; dorsal lengths of the palpal segments: P-I, $19\mu m$ ($19\mu m$ -

(Figs. 262, 264-268, 271, 562, 602)

 21μ m); P-II, 36μ m (34μ m- 38μ m); P-III, 24μ m (21μ m- 24μ m); P-IV, 46μ m (43μ m- 46μ m); P-V, 18μ m (19μ m- 21μ m); structure of palp as shown for the female; capitulum 76μ m (66μ m- 73μ m) in length; chelicera 97μ m (93μ m- 100μ m) in length; all distal segments of the legs tending to be high and laterally compressed; dorsal lengths of the distal segments of the first leg: I-Leg-4, 41μ m (35μ m- 41μ m); I-Leg-5, 45μ m (42μ m- 48μ m); I-Leg-6, 27μ m (24μ m- 28μ m); greatest height of I-Leg-5, 28μ m (24μ m- 26μ m); dorsal lengths of the segments of the fourth leg: IV-Leg-2, 80μ m (73μ m- 83μ m); IV-Leg-3, 33μ m (28μ m- 34μ m); IV-Leg-4, 38μ m (30μ m- 37μ m); IV-Leg-5, 36μ m (31μ m- 34μ m); IV-Leg-6, 52μ m (45μ m- 50μ m); greatest height of IV-Leg-2, 62μ m (52μ m- 69μ m); figure 264 shows the

proportions and chaetotaxy of the fourth leg.

Female: Dorsum as described for male; dorsal shield $327\mu m$ ($304\mu m$ –334 μ m) in length, 265 μ m (251 μ m-274 μ m) in width; ventral shield 460 μ m (418 μ m- $464\mu \mathrm{m}$) in length, $297\mu \mathrm{m}$ ($273\mu \mathrm{m}$ - $304\mu \mathrm{m}$) in width; except for genital field region, ventral shield as described for male; gonopore terminal (fig. 266); a few genital acetabula present on each side; dorsal lengths of the palpal segments: P-I, $19\mu m$ ($17\mu m-21\mu m$); P-II, $36\mu m$ ($34\mu m-36\mu m$); P-III, $22\mu m$ ($21\mu m-23\mu m$); P-IV, $44\mu m$ ($43\mu m$ - $45\mu m$); P-V, $21\mu m$ ($17\mu m$ - $20\mu m$); figure 27l shows the proportions and chaetotaxy of the palp; capitulum $69\mu m$ ($69\mu m$ - $72\mu m$) in length and with a pronounced anterodorsal projection; chelicera $87\mu m$ ($89\mu m$ - $97\mu m$) in length; figure 262 shows a lateral view of the capitulum and chelicera; legs not exhibiting sexual dimorphism and are as described and illustrated for the male; dorsal lengths of the distal segments of the first leg: I-Leg-4, $43\mu m$ ($35\mu m$ -41 μ m); I-Leg-5, 43 μ m (40 μ m-42 μ m); I-Leg-6, 50 μ m (45 μ m-48 μ m); greatest height of I-Leg-5, $27\mu m$ ($24\mu m$ - $28\mu m$); figure 267 illustrates these segments; dorsal lengths of the segments of the fourth leg: N-Leg-2, $79\mu m$ ($73\mu m-76\mu m$); IV-Leg-3, $31\mu m$ ($24\mu m$ - $28\mu m$); IV-Leg-4, $31\mu m$ ($29\mu m$ - $34\mu m$); IV-Leg-5, $31\mu m$ $(28\mu \text{m}-31\mu \text{m})$; IV-Leg-6, $52\mu \text{m}$ $(45\mu \text{m}-49\mu \text{m})$; greatest height of IV-Leg-2, 59 $\mu m (52 \mu m - 59 \mu m)$.

Holotype: Adult of, from the headwaters of Whangamata Stream, 10 km northwest of Taupo, North Island, Nov. 3, 1982.

Allotype: Adult \mathcal{L} , same data as holotype.

Paratypes: NORTH ISLAND: 4 of, Kaeo River, on Waiare Rd 4 km south of junction with Rt 10, Oct. 21, 1982; 1 of, from a stream on Wainui Rd, 5 km west of Mahinepua Rd, Oct. 22, 1982; 2 \, tributary of Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), Oct. 27, 1982; 7 of, 8 \, 9, Torere River at Torere, on Rt 35 north of Opotiki, Oct. 28, 1982; 2 of, Waimana River in ''Gorge'', between Tameatura and Opotiki, Oct. 28, 1982; 1 9, from a stream at Omaukoro Bridge, on Rt 2, in the "Gorge" south of Opotiki, Oct. 29, 1982; SOUTH ISLAND: 4 of, 2 9, from a tributary of the Wakamarina River, 7 km southeast of Canvastown (off Rt 6), Nov. 5, 1982; 2 9, Shag River near its headwaters, on Rt 85, 2 km west of Pigroot Summit (Central Otago), Nov. 16, 1982; 2 of, 1 ♀, Rocky Gully Stream, on Rt 8 between Cave and Fairlie (west of Timaru), Nov. 18, 1982; 43 of, 115 \, Oaro River at Oaro, on Rt l approx. 20 km south of Kaidoura, Nov. 19, 1982; 5 \, 20 \, Irongate Stream on Rt 1, 24 km north of Kairoura, Nov. 21, 1982; 1 of, 1 of, Mororimu Stream on Rt 1, approx. 35 km north of Kaikoura, Nov. 21, 1982; 3 of, 12, Kaituna River on Rt 6, 5 km south of Havelock, Nov. 22, 1982; 2 9, Graham Stream on Rt 6, at picnic grounds, 8 km northeast of Whangamoa Saddle, Nov. 23, 1982; 3 of, Whangamoa River on Rt 6, approx. 5 km northeast of Whangamoa Saddle, Nov. 23, 1982; 2 9, tributary of the Waitapu River at Paynes Ford, 3 km south of Takaka, Nov. 24, 1982.

Discussion: The present species exhibits the fewest derived character states

of any of the four species assigned to the genus. The males of *hopkinsi* have a simple gonopore region, no development of a cauda and none of the setae on I-Leg-4 are modified.

43. Taintaturus accidens, new species

(Figs. 256, 259-261, 263, 564)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 289 μ m in length, 228 μ m in width; anteromedial plate bearing the postocularia; the anterolateral platelets bearing one pair of glandularia; one pair of glandularia on small sclerites lying free; posteromedial plate with two pairs of glandularia; ornamentation of dorsal sclerites consisting of reticulations, some of which are arranged in irregular rows (fig. 564); anteromedial portion of ventral shield forming a dorsal hood which extends forward approximately to tips of first coxae (fig. 261); ventral shield $410\mu m$ in length, $273\mu m$ in width; first coxae blunt; second and third coxae somewhat pointed; well developed intercoxal slots present; projections associated with insertions of fourth legs blunt and with lateral margins curving slightly medially; a pair of glands lying somewhat medial to these projections; gonopore region modified, its morphology better illustrated (fig. 259) than described; a few genital acetabula on each side; dorsal lengths of the palpal segments: P-I, $17\mu m$; P-II, $37\mu m$; P-III, $29\mu m$; P-IV, $52\mu m$; P-V, 16μm; ventral projection of P-III relatively long; figure 256 shows the proportions and chaetotaxy of the palp; capitulum $76\mu m$ in length; structure of capitulum much as shown in figure 262 but anterodorsal projection slightly larger and less pointed; chelicera $93\mu m$ in length; all except the most proximal segments of the legs high and laterally compressed; dorsal lengths of the distal segments of the first leg: I-Leg-4, $48\mu m$; I-Leg-5, $52\mu m$; I-Leg-6, $52\mu m$; greatest height of I-Leg-5, 36µm; one of the two ventral setae on I-Leg-4 "normal", the other short, truncate and somewhat expanded distally (fig. 263); dorsal lengths of the segments of the fourth leg: IV-Leg-2, $88\mu m$; IV-Leg-3, $35\mu m$; IV-Leg-4, $43\mu m$; IV-Leg-5, $48\mu m$; IV-Leg-6, $58\mu m$; greatest height of IV-Leg-2, $41\mu m$; figure 260 shows the proportions and chaetotaxy of the fourth leg.

Female: Unknown.

Holotype: Adult of, from Adamson Creek on Rt. 6, between Lake Ianthe and Wanganui, South Island, Nov. 9, 1982.

Discussion: This species seems most closely related to the following. See remarks under the latter.

44. Taintaturus abditus, new species

(Figs. 252-255, 257, 258, 563)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 289 μ m ($\overline{288}\mu$ m- 304μ m) in length, 224μ m (217μ m- 232μ m) in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; one pair of glandularia on small sclerites lying free; posteromedial plate with two pairs of glandularia; ornamentation of dorsal shield consisting of reticulations arranged in irregular rows and as one focuses downwards, a papillate appearance comes into view (fig. 563); anteromedial portion of ventral shield forming a somewhat pointed dorsal hood which does not extend to the tips of the first coxae (fig. 254); ventral shield 406μ m (395μ m- 440μ m) in length, 274μ m

 $(258\mu\mathrm{m}-282\mu\mathrm{m})$ in width; first coxae blunt; second and third coxae somewhat pointed; intercoxal slots well developed; projections associated with insertions of fourth legs truncate and with lateral margins more or less parallel to the median margins; a pair of glandularia placed somewhat medial to these projections; gonopore region modified, with a posterior cleft; a small concavity with a rounded, posteriorly directed projection located at anterior end of cleft; a few genital acetabula present on each side; morphology of genital field region better illustrated (fig. 252) than described; dorsal lengths of the palpal segments: P-I, IV, $40\mu \text{m} (40\mu \text{m} - 45\mu \text{m})$; P-V, $19\mu \text{m} (20\mu \text{m} - 22\mu \text{m})$; figure 253 shows the proportions and chaetotaxy of the palp; capitulum $79\mu m$ ($76\mu m-82\mu m$) in length; capitulum similar to than shown in figure 262 but anterodorsal projection not as pointed; chelicera $96\mu m$ ($94\mu m$ - $107\mu m$) in length; all except the most proximal leg segments relatively high and laterally compressed; dorsal lengths of the distal segments of the first leg: I-Leg-4, $45\mu m$ ($44\mu m$ - $48\mu m$); I-Leg-5, $48\mu m$ (48 μ m-52 μ m); I-Leg-6, 45 μ m (43 μ m-51 μ m); greatest height of I-Leg-5, 31 μ m $(31\mu\text{m}-35\mu\text{m})$; one of the two ventral setae on I-Leg-4 ''normal'', the other expanded and serrate (fig. 258); dorsal lengths of the segments of the fourth leg: IV-Leg-2, $83\mu m$ ($76\mu m$ - $88\mu m$); IV-Leg-3, $35\mu m$ ($33\mu m$ - $38\mu m$); IV-Leg-4, 40 μ m (38 μ m-48 μ m); IV-Leg-5, 42 μ m (41 μ m-48 μ m); IV-Leg-6, 50 μ m (48 μ m-55) μ m); greatest height of IV-Leg-2, 42 μ m (41 μ m-46 μ m); figure 255 illustrates the fourth leg; in the fourth leg illustrated, the proximal portion of IV-Leg-1 did not break off during removal of the leg but, as mentioned earlier, it rarely survives dissection.

Female: Dorsum as described for the male; dorsal shield $293\mu m$ ($284\mu m$ - $304\mu\mathrm{m}$) in length, $232\mu\mathrm{m}$ ($228\mu\mathrm{m}$ - $232\mu\mathrm{m}$) in width; ventral shield $395\mu\mathrm{m}$ (387 μ m-410 μ m) in length, 262 μ m (258 μ m-273 μ m) in width; except for genital field region, ventral shield as described for male; gonopore terminal; a few genital acetabula on each side (fig. 257); dorsal lengths of the palpal segments: P-I, 17 μ m (17 μ m-18 μ m); P-II, 35 μ m (33 μ m-35 μ m); P-III, 27 μ m (24 μ m-26 μ m); P-IV, $41\mu \text{m}$ ($41\mu \text{m}-43\mu \text{m}$); P-V, $18\mu \text{m}$ ($18\mu \text{m}-19\mu \text{m}$); capitulum $76\mu \text{m}$ ($66\mu \text{m}-76\mu \text{m}$) in length; chelicera $95\mu m$ ($86\mu m-97\mu m$) in length; structure of palp, capitulum and chelicera as described or illustrated for male; dorsal lengths of the distal segments of the first leg: I-Leg-4, $37\mu m$ ($37\mu m$ - $38\mu m$); I-Leg-5, $41\mu m$ ($40\mu m$ -42 μ m); I-Leg-6, 43 μ m (43 μ m-45 μ m); greatest height of I-Leg-5, 26 μ m-28 μ m; segments of first leg similar to those shown for the male but not quite as high and without the modified seta on I-Leg-4; dorsal lengths of the segments of the fourth leg: IV-Leg-2, $72\mu m$ ($72\mu m$ - $76\mu m$); IV-Leg-3, $31\mu m$ ($29\mu m$ - $31\mu m$); IV-Leg-4, $35\mu m$ ($36\mu m-41\mu m$); IV-Leg-5, $35\mu m$ ($36\mu m-38\mu m$); IV-Leg-6, $47\mu m$ $(48\mu \text{m}-49\mu \text{m})$; greatest height of IV-Leg-2, $34\mu \text{m}$ $(35\mu \text{m}-38\mu \text{m})$; female fourth leg similar to that of male.

Holotype: Adult of, Whangamoa River on Rt 6, approx. 5 km northeast of Whangamoa Saddle, northern South Island, Nov. 23, 1982.

Allotype: Adult \(\begin{aligned} \text{, same data as holotype.} \end{aligned} \)

Paratypes: SOUTH ISLAND: 2 of, 1 \(\text{?}, \text{ Opouri River between Carluke and Opouri Valley, on Tennyson Inlet Rd, Nov. 6, 1982; 1 \(\text{?}, \text{ Graham Stream on Rt 6, at picnic grounds 8 km northeast of Whangamoa Saddle, Nov. 6, 1982; 2 of, Adamson Creek on Rt 6, between Lake Ianthe and Wanganui, Nov. 9, 1982; 3 \(\text{?}, \text{ Potters Creek on Rt 6, between Bruce Bay and Lake Paringa (north of Haast), Nov. 10, 1982; 3 \(\text{?}, \text{ same data as holotype.} \)

<u>Discussion</u>: The present species and the preceding, *T. accidens*, are closely related, differing most noticeably in the more pronounced sexual dimorphism of

the genital field region in *abditus* (compare figures 252, 259). Also the modified setae on I-Leg-4 are different with the present species bearing the largest seta (compare figures 258, 263). These two species exhibit a more derived condition of the male genital field than in *hopkinsi*.

45. Taintaturus projectus, new species

(Figs. 269, 270, 272-275, 565)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 236 μm (234 μm -236 μm) in length, 192 μm (200 μm) in width; anteromedial plate with the postocularia; anterolateral platelets bearing a pair of glandularia; one pair of glandularia lying on small, free sclerites; posteromedial plate with two pairs of glandularia; ornamentation of the dorsal sclerites consisting of ill defined lines and small body pores as shown for the female (fig. 565); anteromedial portion of ventral shield with a somewhat pointed dorsal hood which does not extend nearly to the tips of the first coxae; cauda, when viewed dorsally, extending well posterior to excretory pore and bearing a pair of glandularia (fig. 275); ventral shield $355\mu\mathrm{m}$ ($355\mu\mathrm{m}$ – $359\mu\mathrm{m}$) in length, $229\mu\mathrm{m}$ ($222\mu\mathrm{m}$ – $225\mu\mathrm{m}$) in width; anterior three pairs of coxae more or less pointed; intercoxal slots well developed; projections associated with insertions of fourth legs truncate and moderately wide; a pair of glands located immediately lateral to these projections; gonopore terminal and located on a small cauda (fig. 273); gonopore surrounded by several small setae; a few genital acetabula on each side; dorsal lengths of the palpal segments: P-I, $13\mu m$; P-II, $34\mu m$ ($33\mu m-35\mu m$); P-III, $20\mu m$ ($20\mu m-21\mu m$); P-IV, $36\mu m$ ($35\mu m$ - $36\mu m$); P-V, $20\mu m$ ($18\mu m$ - $19\mu m$); palp similar to that shown for female; capitulum $69\mu m$ ($64\mu m$ - $67\mu m$) in length; chelicera $79\mu m$ ($83\mu m$) in length; structure of capitulum much as shown in figure 262 but anterodorsal projection is larger and more rounded; all except the most proximal leg segments high and laterally compressed; dorsal lengths of the distal segments of the first leg: I-Leg-4, $36\mu \text{m}$ ($34\mu \text{m}$ - $35\mu \text{m}$); I-Leg-5, $36\mu \text{m}$ ($35\mu \text{m}$ - $38\mu \text{m}$); I-Leg-6, 39 μm (36 μm -38 μm); greatest height of I-Leg-5, 30 μm (29 μm -30 μm); structure of these segments as shown for the female; dorsal lengths of the segments of the fourth leg: IV-Leg-2, $61\mu m$ ($52\mu m$ - $62\mu m$); IV-Leg-3, $31\mu m$ ($28\mu m$ - $30\mu m$); IV-Leg-4, $41\mu m$ ($36\mu m$ - $38\mu m$); IV-Leg-5, $44\mu m$ ($39\mu m$ - $41\mu m$); IV-Leg-6, $40\mu m$ $(34\mu \text{m}-39\mu \text{m})$; greatest height of IV-Leg-2, $41\mu \text{m}$ $(42\mu \text{m})$; greatest height of IV-Leg-4, $69\mu m$ ($62\mu m$ - $66\mu m$); figure 272 shows the proportions and chaetotaxy of the fourth leg.

Female: Dorsal shield as described for male; dorsal shield $281\mu m$ in length, $207\mu m$ in width; figure 565 shows the ornamentation of the dorsal shield; ventral shield $362\mu m$ in length, $233\mu m$ in width; anterior portion of ventral shield similar to male but projections associated with insertions of fourth legs are smaller and there is no development of a cauda (fig. 269); ridges posterior to insertions of fourth legs curving medially; gonopore terminal; a few acetabula present on each side; dorsal lengths of the palpal segments: P-I, $14\mu m$; P-II, $35\mu m$; P-III, $19\mu m$; P-IV, $35\mu m$; P-V, $18\mu m$; figure 270 shows the proportions and chaetotaxy of the palp; capitulum $69\mu m$ in length; chelicera $86\mu m$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $34\mu m$; I-Leg-6, $38\mu m$; greatest height of I-Leg-5, $31\mu m$; figure 274 shows these segments; dorsal lengths of the segments of the fourth leg: IV-Leg-2, $52\mu m$; IV-Leg-3, $29\mu m$; IV-Leg-4, $34\mu m$; IV-Leg-5, $31\mu m$; IV-Leg-6, $38\mu m$; greatest height of IV-Leg-2, $43\mu m$; greatest height of IV-Leg-4, $41\mu m$; structure of fourth leg is

somewhat similar to that shown for the male but ventral bulge on IV-Leg-4 is not as pronounced.

Holotype: Adult of, from Adamson Creek on Rt 6, between Lake Ianthe and Wanganui, South Island, Nov. 9, 1982.

Allotype: Adult \(\begin{aligned} \text{, same data as holotype.} \end{aligned} \)

Paratypes: SOUTH ISLAND: 1 of, Whale Creek on Rt 6, west of Murchison, Nov. 7, 1982; 1 of, from Cole Creek on Rt 6, between Lake Moeraki and Haast, Nov. 10, 1982.

Discussion: Males of the present species may be easily separated from the other known species of the genus by its possession of a cauda and IV-Leg-4 is greatly expanded ventrally (fig. 272). Females also show this ventral expansion of IV-Leg-4 which, although not as great as in the male, is much greater than in females of the the other species. The ornamentation of the dorsal sclerites is the least complex of the genus (fig. 565) and is also diagnostic.

Genus ABELATURUS, new genus

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets bearing one pair of glandularia; a pair of small glandularia sclerites located between medial corners of anterolateral and posterolateral platelets and lateral edge of posteromedial plate; posteromedial plate with two pairs of glandularia; dorsal sclerites reticulate (fig. 566); anterodorsal portion of ventral shield produced into a somewhat pointed hood which extends beyond tips of coxae; coxal slots well developed; projections associated with insertions of fourth legs very large and somewhat pointed (figs. 276, 281); a pair of glands immediately posteromedial to insertions of fourth legs; no pronounced sexual dimorphism of the legs; leg segments laterally compressed and high dorsoventrally (although the height of the anterior legs not as high as in members of the preceding two genera); IV-Leg-2 is largest segment of the fourth leg; IV-Leg-3 short, partially covered by IV-Leg-2 and its ventral side reduced to a median angle bearing two setae (fig. 277); capitulum much longer than high, without an anchoral process and attached to a tube of soft integument to form somewhat protrusible mouthparts (fig. 282); P-IV not broadened as in the previous two genera.

Type Species: Abelaturus cornophorus, new species.

46. Abelaturus cornophorus, new species

(Figs. 276-278, 280-282, 285, 566)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 350 μm (338 μm -374 μm) in length, 273 μm (265 μm -297 μm) in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; one pair of glandularia on "free" sclerites; posteromedial plate with two pairs of glandularia; ornamentation of dorsal sclerites consisting of a reticulate pattern as shown for the female (fig. 566); anteromedial portion of ventral shield forming a somewhat pointed dorsal hood which extends far beyond the tips of the first coxae; ventral shield 486 μm (460 μm -502 μm) in length, 312 μm (304 μm -334 μm) in width; tips of first three pairs of coxae somewhat pointed; capitular bay relatively shallow; intercoxal slots well developed; projections associated with insertions of fourth legs extremely large, projecting posterolaterally to edges of body (fig. 281); a pair of glandularia located somewhat medial to these projections; genital field region relatively simple, consisting of a small, oval gono-

pore flanked by three setae, which is located well anterior to the posterior end; a few genital acetabula present on each side; anterolateral portion of ventral shield with horn-like projections and posterolateral edges of ventral shield with small, posteriorly-directed projections (these may be more dorsally placed on the upper rim of ventral shield and not apparent in ventral view; dorsal lengths of the palpal segments: P-I, $17\mu m$ ($17\mu m-19\mu m$); P-II, $32\mu m$ ($30\mu m-31\mu m$); P-III, $20\mu \text{m}$ ($18\mu \text{m}-19\mu \text{m}$); P-IV, $51\mu \text{m}$ ($48\mu \text{m}-52\mu \text{m}$); P-V, $22\mu \text{m}$ ($21\mu \text{m}-22\mu \text{m}$); the morphology of palp as illustrated for the female; capitulum $121\mu\mathrm{m}$ ($117\mu\mathrm{m}$ - $125\mu m$) in length; capitulum much longer than high with palp inserted well proximal to tip; capitulum attached to soft integument to form somewhat protrusible mouthparts; morphology of capitulum as shown for the female; chelicera 121μ m (ll4 μ m-l24 μ m) in length; leg segments of first three pairs of legs tending to be longer and less proportionally high than in members of the genera Palnaturus and Taintaturus; dorsal lengths of the distal segments of the first leg: I-Leg-4, $38\mu \text{m} (36\mu \text{m} - 38\mu \text{m}); \text{I-Leg-5}, 41\mu \text{m} (39\mu \text{m} - 43\mu \text{m}); \text{I-Leg-6}, 58\mu \text{m} (57\mu \text{m} - 60)$ μ m); greatest height of I-Leg-5, 24μ m (24μ m- 27μ m); dorsal lengths of the segments of the fourth leg: IV-Leg-2, $69\mu m$ ($67\mu m$ - $69\mu m$); IV-Leg-3, $24\mu m$ ($23\mu m$ - $24\mu \text{m}$); IV-Leg-4, $28\mu \text{m}$ ($27\mu \text{m}$ - $31\mu \text{m}$); IV-Leg-5, $34\mu \text{m}$ ($32\mu \text{m}$ - $33\mu \text{m}$); IV-Leg-6, $45\mu \text{m}$ ($46\mu \text{m}$ - $49\mu \text{m}$); greatest height of IV-Leg-2, $31\mu \text{m}$ ($28\mu \text{m}$ - $31\mu \text{m}$); length of IV-Leg-1 not given because proximal portion is always broken off, but its distal portion proportionally much longer than in the preceding two genera.

Female: Dorsum as described for male; dorsal shield $380\mu m$ ($304\mu m$ –365 μ m) in length, 319μ m (266μ m- 289μ m) in width; figure 566 shows the ornamentation of the dorsum; ventral shield $547\mu m$ ($425\mu m-502\mu m$) in length, $349\mu m$ (304) μ m-334 μ m) in width; except for genital field region, ventral shield as described for male; gonopore terminal and comparatively small and narrow (fig. 276); a few genital acetabula on each side; dorsal lengths of the palpal segments: P-I, $21\mu \text{m}$ (19 μm -20 μm); P-II, 33 μm (31 μm -33 μm); P-III, 19 μm (19 μm -21 μm); P-IV, $53\mu \text{m}$ ($48\mu \text{m}$ - $53\mu \text{m}$); P-V, $23\mu \text{m}$ ($21\mu \text{m}$ - $23\mu \text{m}$); figure 280 illustrates the proportions and chaetotaxy of the palp; capitulum $124\mu m$ ($93\mu m$ - $114\mu m$) in length and as described for male; chelicera $127\mu m$ ($97\mu m$ - $121\mu m$) in length; figure 282 shows a lateral view of the capitulum; dorsal lengths of the distal segments of the first leg: I-Leg-4, $41\mu m$ ($38\mu m-40\mu m$); I-Leg-5, $46\mu m$ ($43\mu m-45\mu m$); I-Leg-6, 62 μm (62 μm -63 μm); greatest height of I-Leg-5, 25 μm ; figure 285 shows these segments; dorsal lengths of the segments of the fourth leg: IV-Leg-2, 79µm (62) μ m-76 μ m); IV-Leg-3, 25 μ m (21 μ m-26 μ m); IV-Leg-4, 31 μ m (28 μ m-31 μ m); IV-Leg-5, $33\mu m$ ($28\mu m$ - $31\mu m$); IV-Leg-6, $48\mu m$ ($45\mu m$ - $48\mu m$); figure 277 illus-

trates the fourth leg.

Holotype: Adult of, tributary of the Wakamarina River, 7 km southeast of Canvastown (off Rt 6), South Island, Nov. 5, 1982.

Allotype: Adult \(\begin{aligned} \text{, same data as holotype.} \end{aligned} \)

Paratypes: 2 \, from a tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglan (Coromandel Peninsula), North Island, Oct. 27, 1982; 4 of, from the Whangamoa River on Rt 6, approx. 5 km northeast of Whangamoa Saddle, South Island, Nov. 23, 1982.

Discussion: This is presently the only known member of its genus, and the characters given in the generic key are diagnostic.

Genus OMEGATURUS, new genus

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets bearing one pair of glandularia; a pair of small glandularia sclerites located between medial corners of anterolateral and posterolateral platelets and the lateral edges of the posteromedial plate; posteromedial plate bearing two pairs of glandularia; dorsal sclerites with small reticulations (fig. 567); anterodorsal portion of ventral shield with a very broad hood which is indented medially (much as shown in figure 350); coxal slots well developed; projections associated with insertions of fourth legs of moderate size and truncate; a pair of glands located somewhat posteromedial to insertions of the fourth legs; no sexual dimorphism of the legs; leg segments, with the exception of IV-Leg-2, not laterally compressed, and even this segment is only slightly compressed; IV-Leg-3 short, with its ventral side becoming reduced to a median angle and bearing two setae (fig. 287); IV-Leg-2 only slightly covering IV-Leg-3; capitulum long, with an anchoral process and not protrusible; palpal segments elongated, P-II with a few small ventral integumental projections (fig. 283).

Type Species: Omegaturus longipalpis, new species.

Discussion: If one disregards the elongated capitulum and palpal segments which are without doubt derived conditions, this genus exhibits character states which seem to be at the beginning of transformation series in which the more derived conditions are found in the preceding three genera. These characteristics include greater dorsoventral expansion and lateral compression of the leg segments and greater development of an anterodorsal hood in the other three genera. Omegaturus shares a number of similarities with the genus Piotaturus, which is described later in this paper. See remarks under the latter genus.

47. Omegaturus longipalpis, new species

(Figs. 279, 283, 284, 286, 287, 290, 567)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 456 μm (426 μm -430 μm) in length, 410 μm (365 μm -395 μm) in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; one pair of glandularia on small free-lying sclerites; posteromedial plate with two pairs of glandularia; with a slight development of ridges on the dorsum; ornamentation of dorsum as shown for the female (fig. 567); anteromedial portion of ventral shield with a broad, medially indented hood similar to that shown in figure 350 but is even larger; ventral shield $638\mu m$ ($600\mu m$ - $610\mu m$) in length, $425\mu \text{m}$ (395 μm -410 μm) in width; well developed coxal slots present; projections associated with insertions of fourth legs truncate and expanded at ends, with the lateral margins extending anteromedially; a pair of glands located slightly posteromedial to these projections; genital field area slightly projecting; gonopore small and somewhat subterminal; a few genital acetabula on each side; figure 286 shows the structure of the genital field; dorsal lengths of the palpal segments: P-I, $34\mu m$ ($29\mu m$ - $31\mu m$); P-II, $100\mu m$ ($93\mu m$ - $98\mu m$); P-III, $97\mu m$ ($93\mu m$ - $95\mu m$); P-IV, $145\mu m$ ($147\mu m$ - $149\mu m$); P-V, $27\mu m$ ($24\mu m$ - $27\mu m$); ventral side of P-II with a few small cuticular spines; palpal segments greatly elongated as illustrated for the female; capitulum $131\mu m$ ($121\mu m$ – $128\mu m$) in length; chelicera 104 μm (104 μm -117 μm) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $69\mu m$ ($62\mu m$ - $66\mu m$); I-Leg-5, $79\mu m$ ($76\mu m$ - $78\mu m$); I-Leg-6, $79\mu m$ μm (76μm-79μm); greatest height of I-Leg-5, 26μm; structure of these segments as shown for female; dorsal lengths of the segments of the fourth leg: IV-Leg-2, $91\mu \text{m}$ ($87\mu \text{m}$ - $89\mu \text{m}$); IV-Leg-3, $32\mu \text{m}$ ($31\mu \text{m}$ - $32\mu \text{m}$); IV-Leg-4, $76\mu \text{m}$ $(73\mu \text{m}-75\mu \text{m})$; IV-Leg-5, $76\mu \text{m}$ $(73\mu \text{m}-75\mu \text{m})$; IV-Leg-6, $73\mu \text{m}$ $(69\mu \text{m}-71\mu \text{m})$; greatest height of IV-Leg-2, $38\mu m$ ($35\mu m$ - $37\mu m$); figure 287 shows the proportions and chaetotaxy of the fourth leg.

Female: Dorsum as described for the male; dorsal shield 410μ m (418μ m- 456μ m) in length, 365μ m (368μ m- 395μ m) in width; ventral shield 593μ m (593μ m- 654μ m) in length, 395μ m (395μ m- 426μ m) in width; except for genital field region, ventral shield as described for male; gonopore terminal; a few genital acetabula on each side (fig. 290); dorsal lengths of the palpal segments: P-I, 33μ m (31μ m- 35μ m); P-II, 93μ m (95μ m- 100μ m); P-III, 87μ m (89μ m- 97μ m); P-IV, 143μ m (139μ m- 149μ m); P-V, 27μ m (27μ m- 28μ m); capitulum 130μ m (128μ m- 135μ m) in length; chelicera 117μ m (121μ m- 124μ m) in length; figure 283 illustrates the capitulum and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 59μ m (62μ m- 66μ m); I-Leg-5, 73μ m (75μ m- 78μ m); I-Leg-6, 72μ m (73μ m- 76μ m); greatest height of I-Leg-5, 25μ m (24μ m- 25μ m); figure 279 shows these segments; dorsal lengths of the segments of the fourth leg: IV-Leg-2, 80μ m (81μ m- 83μ m); IV-Leg-3, 31μ m (29μ m- 35μ m); IV-Leg-4, 69μ m (69μ m- 77μ m); IV-Leg-5, 72μ m (66μ m- 74μ m); IV-Leg-6, 69μ m (69μ m- 73μ m); greatest height of IV-Leg-2, 34μ m (36μ m- 37μ m); fourth leg as shown for male.

Holotype: Adult of, from a stream at Sandy's Bridge, on Rt 2 in the "Gorge"

south of Opotiki, North Island, Oct. 29, 1982.

Allotype: Adult \(\begin{aligned} \text{, same data as holotype.} \end{aligned} \)

Paratypes: NORTH ISLAND: 1 of, 1 \, same area as holotype on June 3, 1981; 1 of, from a stream at Opato Bridge, 67 km southeast of Opotiki, June 3, 1981; 1 of, 1 \, same data as holotype; SOUTH ISLAND: 2 \, from Graham Stream on Rt 6, at picnic grounds, 8 km northeast of Whangamoa Saddle, Nov. 23, 1982; 2 \, Whangamoa River on Rt 6, approx. 5 km northeast of Whangamoa Saddle, Nov. 23, 1982.

Genus TRYSSATUROPSIS Cook

Tryssaturopsis Cook, 1974. Mem. Amer. Ent. Inst., 21: 355.

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets bearing one pair of glandularia; posteromedial plate with three pairs of glandularia; projections associated with insertions of fourth legs appearing more or less pointed in ventral view, with a few to many setae along lateral margins of these projection; IV-Leg-l very long and bearing numerous setae; IV-Leg-2 with a ventral or distoventral projection; males with a distinct cauda and the fourth leg exhibiting a pronounced sexual dimorphism; P-IV of relatively uniform height along entire length and with a small, thickened terminal seta on medial side (fig. 288).

Type Species: Tryssaturopsis novus (Hopkins).

Discussion: Cook (1974) described *Tryssaturopsis* as a subgenus of *Tryssaturus* but it certainly deserves full generic ranking.

KEY TO THE NEW ZEALAND SPECIES OF TRYSSATUROPSIS

2. Some of the papillae of the dorsal shield much larger than the rest (fig. 570); male cauda relatively narrow (fig. 304)

Tryssaturopsis parvicaudatus, new species . (p. 66)
Papillae of dorsal shield of relatively uniform size (fig. 568); male cauda wide and tripartate (fig. 289)

Tryssaturopsis asopos, new species (p. 65)

3. Projection on male IV-Leg-2 extending directly ventrally with the dimensions in this direction greater than length of segment; swimming hairs absent from flattened surface of male IV-Leg-4 (fig. 300); male cauda somewhat pointed laterally (fig. 293)

Projection on male IV-Leg-2 extending slightly distally as well as ventrally, with dimensions in this direction less than length of the segment; swimming hairs present on flattened surface of male IV-Leg-4 (fig. 299); male cauda more rounded laterally (fig. 302)

Tryssaturopsis solivagus, new species ... (p. 69)

48. Tryssaturopsis asopos, new species

(Figs. 288, 289, 291, 292, 294, 296, 568)

Male: Both eye and integumental pigment developed; dorsal shield $395\mu\mathrm{m}$ $(342\overline{\mu}\text{m}-380\mu\text{m})$ in length, $380\mu\text{m}$ $(327\mu\text{m}-365\mu\text{m})$ in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; posteromedial plate with three pairs of glandularia; dorsal shield with ridges which are similar, but somewhat more pronounced, than shown for female; dorsal sclerites with small papillae of a relatively uniform size (fig. 568); ventral shield $562\mu m$ (479 μm - $562\mu m$) in length, $399\mu m$ (361 μm - $380\mu m$) in width; anterior coxae projecting; glands of the fourth coxae lateral to anterior ends of the insertions of fourth legs; projections associated with insertions of fourth legs bluntly pointed and with numerous setae on lateral margins; genital field lying on a well developed cauda whose morphology is better illustrated (fig. 292) than described; cauda $304\mu m$ ($262\mu m$ - $293\mu m$) in width; a pair of ridges extending anteromedially from corners of body proper; gonopore small and nearly terminal; many genital acetabula present, these in three groups (fig. 289) and mostly confined to the dorsal surface; dorsal lengths of the palpal segments: P-I, $31\mu m$ $(29\mu \text{m}-30\mu \text{m}); \text{P-II}, 59\mu \text{m} (59\mu \text{m}-62\mu \text{m}); \text{P-III}, 29\mu \text{m} (27\mu \text{m}-30\mu \text{m}); \text{P-IV},$ $96\mu m$ ($97\mu m$); P-V, $28\mu m$ ($29\mu m$ - $30\mu m$); structure of palp as shown for the female; capitulum $107\mu m$ ($97\mu m$ - $107\mu m$) in length; chelicera $145\mu m$ ($131\mu m$ - $140\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $83\mu m$ $(84\mu m)$; I-Leg-5, $93\mu m$ $(92\mu m)$; I-Leg-6, $92\mu m$ $(90\mu m)$; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $222\mu m$ ($196\mu m$ - $241\mu m$); IV-Leg-2, $96\mu m$ $(81\mu \text{m}-89\mu \text{m}); \text{ N-Leg-3}, 96\mu \text{m} (93\mu \text{m}-97\mu \text{m}); \text{ N-Leg-4}, 133\mu \text{m} (129\mu \text{m}-141\mu \text{m});$ IV-Leg-5, $118\mu m$ (125 $\mu m-131\mu m$); IV-Leg-6, $137\mu m$ (118 $\mu m-133\mu m$); projection

on IV-Leg-2 extending distoventrally and truncate; IV-Leg-4 only slightly ex-

panded; figure 294 shows the structure of the fourth leg.

Female: Ornamentation and arrangement of glandularia as described for the male; dorsal shield 425μm (364μm-425μm) in length, 380μm (334μm-388μm) in width; ventral shield 516μm (434μm-547μm) in length, 395μm (342μm-399μm) in width; anterior coxae projecting; glands of the fourth coxae located slightly anteromedial to insertions of fourth legs; projections associated with insertions of fourth legs pointed when viewed ventrally, and with several setae on lateral margins; genital field region somewhat projecting; genital acetabula numerous; figure 296 shows the morphology of the ventral shield; dorsal lengths of the palpal segments: P-I, 32μ m (29μ m- 33μ m); P-II, 58μ m (52μ m- 59μ m); P-III, 28μ m (27μ m- 31μ m); P-IV, 76μ m (66μ m- 77μ m); P-V, 29μ m (28μ m- 31μ m); figure 288 shows the proportions and chaetotaxy of the palp; capitulum 103μ m (103μ m- 110μ m) in length; chelicera 138μ m (138μ m- 159μ m) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 69μ m (66μ m- 70μ m); I-Leg-5, 77μ m (73μ m- 86μ m); I-Leg-6, 76μ m (76μ m- 83μ m); figure 291 shows the structure of these segments.

Holotype: Adult of, from Waikohatu Stream on Rt 12, in the Kauri Forest,

northern North Island, May 29, 1981.

Allotype: Adult \(\begin{aligned} \text{, same data as holotype.} \end{aligned} \)

Paratypes: NORTH ISLAND: 3 of, 4 \(\), same data as holotype; 1 of, from Te Whaiau Stream at junction of Rt 47 and Rotaaria Rd, June 5, 1981; 1 \(\), Waikohatu Stream on Rt 12 (in Waipoua State Forest), Oct. 24, 1982; 1 \(\), Torere River at Torere, on Rt 35 north of Opotiki, Oct. 28, 1982; 1 \(\), 4 \(\), from a stream 1 km north of Tohere (east of Opotiki) on Rt 35, Oct. 29, 1982; 2 of, 14 \(\), from the Kotare "River", on Rt. 30, Oct. 31, 1982.

Discussion: The structure of the cauda (fig. 289) and the only slight expansion of IV-Leg-4 are diagnostic for the male. A dorsal shield with pronounced ridges, papillae of the dorsum all the same size and position of the glands of the fourth coxae somewhat anteromedial to insertions of fourth legs are diagnostic for the female.

49. Tryssaturopsis parvicaudatus, new species

(Figs. 301, 303-305, 307, 570)

Male: Both eye and integumental pigment developed; dorsal shield $395 \mu \mathrm{m}$ $(350\mu m-374\mu m)$ in length, $358\mu m$ $319\mu m-350\mu m$) in width; anteromedial plate bearing the postocularia; anterolateral platelets bearing a pair of glandularia; posteromedial plate with three pairs of glandularia; dorsal shield with both large and small papillae as in the female (fig. 570); ventral shield $547\mu m$ ($502\mu m$ -520- μ m) in length, 380 μ m (334 μ m-365 μ m) in width; anterior coxae projecting; glands of the fourth coxae located somewhat anteromedial to insertions of fourth legs; projections associated with insertions of fourth legs somewhat pointed and with several setae on lateral margins; genital field on a proportionally narrow but distinct cauda whose morphology is better illustrated (fig. 307) than described; cauda $167\mu m$ ($152\mu m$ - $167\mu m$) in width; well developed ridges extending anteromedially from posterior corners of body proper; gonopore small, simple and almost terminal; many genital acetabula present, most of which are confined to the ventral surface; dorsal lengths of the palpal segments: P-I, $29\mu m$ ($28\mu m$ -29 μ m); P-II, 52μ m (48μ m- 52μ m); P-III, 26μ m (24μ m- 25μ m); P-IV, 69μ m (64μ m- $69\mu \text{m}$); P-V, $27\mu \text{m}$ ($25\mu \text{m}$ - $28\mu \text{m}$); structure of palp as shown for a related species (fig. 288); capitulum $86\mu m$ ($73\mu m-80\mu m$) in length; chelicera $114\mu m$ ($97\mu m-111\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $72\mu m$ ($66\mu m-69\mu m$); I-Leg-5, $83\mu m$ ($76\mu m-83\mu m$); I-Leg-6, $79\mu m$ ($72\mu m-79\mu m$); dorsal lengths of the segments of the fourth leg: IV-Leg-1, $207\mu m$ ($200\mu m-207\mu m$); IV-Leg-2, $89\mu m$ ($81\mu m-91\mu m$); IV-Leg-3, $59\mu m$ ($59\mu m-63\mu m$); IV-Leg-4, $137\mu m$ ($126\mu m-130\mu m$); IV-Leg-5, $111\mu m$ ($104\mu m-108\mu m$); IV-Leg-6, $111\mu m$ ($109\mu m-115\mu m$); IV-Leg-2 with a distoventral projection which is somewhat truncate; IV-Leg-4 greatly expanded; figure 305 shows the proportions and chaetotaxy of the fourth leg.

Female: Ornamentation and arrangement of the glandularia of the dorsum as described for the male; dorsal shield $388\mu m$ ($380\mu m-406\mu m$) in length, $349\mu m$ $(342\mu \text{m}-364\mu \text{m})$ in width; figure 570 shows the enlarged papillae on the dorsal sclerites which are characteristic of this species; ventral shield $502\mu m$ (486 μm - $502\mu\mathrm{m}$) in length, $364\mu\mathrm{m}$ ($356\mu\mathrm{m}$ - $380\mu\mathrm{m}$) in width; anterior coxae projecting; glands of fourth coxae located anterior but slightly medial to insertions of the fourth legs; projections associated with insertions of fourth legs appearing to be pointed in ventral view and with several setae on lateral edges; genital field region distinctly set off from remainder of ventral shield; genital acetabula numerous; figure 301 shows the morphology of the ventral shield; dorsal lengths of the palpal segments: P-I, $29\mu m$ ($29\mu m-32\mu m$); P-II, $52\mu m$ ($48\mu m-55\mu m$); P-III, $27\mu \text{m}$ ($24\mu \text{m}$ - $28\mu \text{m}$); P-IV, $67\mu \text{m}$ ($65\mu \text{m}$ - $72\mu \text{m}$); P-V, $28\mu \text{m}$ ($27\mu \text{m}$ - $29\mu \text{m}$); capitulum $90\mu \text{m}$ ($87\mu \text{m}$ – $90\mu \text{m}$) in length; chelicera $117\mu \text{m}$ ($117\mu \text{m}$ – $130\mu \text{m}$) in length; figure 303 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $60\mu m$ ($59\mu m$ - $64\mu m$); I-Leg-5, $66\mu m$ ($66\mu m$ - $71\mu m$); I-Leg-6, $69\mu m$ ($66\mu m$ - $69\mu m$).

Holotype: Adult of, from Waikohatu Stream on Rt 12 (in the Kauri Forest),

northern North Island, May 29, 1981.

Allotype: Adult \(\beta \), same data as holotype.

Paratypes: 1 of, 8 \, same data as holotype; 4 of, 1 \, from Waikohatu Stream on Rt 12 (in Waipoua State Forest), northern North Island, Oct. 24, 1982.

<u>Discussion:</u> The narrow cauda is diagnostic for the male. Females may be distinguished from other members of the genus by the presence of conspicuous enlarged papillae on the dorsal sclerites (fig. 570).

50. Tryssaturopsis novus (Hopkins)

(Figs. 293, 295, 297, 300, 569)

Tryssaturus novus Hopkins, 1967. Trans. Royal Soc. New Zealand, 10: 41. Tryssaturus (Tryssaturopsis) novus Cook, 1974. Mem. Amer. Ent. Inst., 21: 355.

Male: Both eye and integumental pigment well developed; dorsal shield 380 μ m ($\overline{372}\mu$ m-410 μ m) in length, 304 μ m (274 μ m-319 μ m) in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; posteromedial plate with three pairs of glandularia; dorsal shield with a reticulate ornamentation as shown for the female (fig. 569); ventral shield 525 μ m (502 μ m-532 μ m) in length, 319 μ m (304 μ m-349 μ m) in width; anterior coxae projecting; glands of the fourth coxae lying directly anterior to insertions of the fourth legs; projections associated with insertions of fourth legs pointed when viewed laterally and with a few setae on lateral margins; genital field lying on a well developed cauda whose morphology is better illustrated (fig. 295) than des-

cribed; cauda $288\mu m$ ($266\mu m$ - $290\mu m$) in width; U-shaped ridges, partially enclosing a pair of glandularia, extending anteromedially at base of cauda and beginning well medial to corners of body proper; gonopore small, simple and almost terminal; many genital acetabula present, most of which are confined to the dorsal surface (fig. 293); dorsal lengths of the palpal segments: P-I, 31µm $(27\mu \text{m}-31\mu \text{m}); \text{ P-II}, 64\mu \text{m} (62\mu \text{m}-66\mu \text{m}); \text{ P-III}, 31\mu \text{m} (28\mu \text{m}-31\mu \text{m}); \text{ P-IV}, 80$ μm (76 μm -80 μm); P-V, 31 μm (30 μm -31 μm); structure of palp as in the related species (fig. 288); capitulum $93\mu m$ ($89\mu m$ - $90\mu m$) in length; chelicera $145\mu m$ (142μm-146μm) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $83\mu \text{m}$ ($76\mu \text{m}$ - $79\mu \text{m}$); I-Leg-5, $86\mu \text{m}$ ($86\mu \text{m}$ - $87\mu \text{m}$); I-Leg-6, $83\mu \text{m}$ ($84\mu \text{m}$ - $87\mu m$); dorsal lengths of the segments of the fourth leg: IV-Leg-1, $177\mu m$ (163) μ m-170 μ m); IV-Leg-2, 88 μ m (74 μ m-81 μ m); IV-Leg-3, 96 μ m (81 μ m-94 μ m); IV-Leg-4, $148\mu\text{m}$ ($133\mu\text{m-}162\mu\text{m}$); IV-Leg-5, $133\mu\text{m}$ ($133\mu\text{m-}141\mu\text{m}$); IV-Leg-6, $125\mu m$ ($123\mu m$ - $126\mu m$); W-Leg-2 with a large projection which extends directly ventrally; IV-Leg-4 greatly expanded; figure 300 shows the proportions and chaetotaxy of the fourth leg,

Female: Ornamentation and arrangement of the glandularia of dorsum as described for male; dorsal shield $380\mu m$ ($372\mu m$ – $395\mu m$) in length, $297\mu m$ ($289\mu m$ – $319\mu m$) in width; figure 569 is a photograph of the dorsum; ventral shield $456\mu m$ ($440\mu m$ – $456\mu m$) in length, $304\mu m$ ($296\mu m$ – $319\mu m$) in width; anterior coxae projecting; glands of the fourth coxae located nearly directly anterior to the insertions of the fourth legs; projections associated with insertions of the fourth legs pointed when viewed ventrally and with two or three setae on lateral margins; genital field region not distinctly set off from body; genital acetabula numerous; figure 297 shows the morphology of the ventral shield; dorsal lengths of the palpal segments: P-I, $30\mu m$ ($30\mu m$ – $31\mu m$); P-II, $65\mu m$ ($62\mu m$ – $66\mu m$); P-III, $31\mu m$ ($30\mu m$ – $33\mu m$); P-IV, $76\mu m$ ($71\mu m$ – $80\mu m$); P-V, $31\mu m$ ($29\mu m$ – $31\mu m$); structure of palp similar to that of the related species (fig. 288); capitulum $86\mu m$ ($87\mu m$ – $90\mu m$) in length; chelicera $152\mu m$ ($149\mu m$ – $152\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $72\mu m$ ($67\mu m$ – $76\mu m$); I-Leg-5, $76\mu m$ ($71\mu m$ – $81\mu m$); I-Leg-6, $74\mu m$ ($71\mu m$ – $83\mu m$).

Material Examined: NORTH ISLAND: 13 σ, 14 ♀, Waikohatu Stream on Rt 12 (in Kauri Forest), May 29, 1981; 2 σ, 3 ♀, from Te Whaiau Stream at junction of Rt 47 and Rotoaria Rd, June 5, 1981; 10 σ, 17 ♀, Orauhora Stream on Rt 30, between Barryville and Benneydale, June 6, 1981; 3 ♀, Waikohatu Stream on Rt 12 (in Waipoua State Forest), Oct. 24, 1982; 1 σ, Mangamawhete Stream on Rt 3, between Inglewood and Stratford (Egmont area), Nov. 1, 1982; 18 σ, 17 ♀, from a stream on Rt 6 just north of Makatote Viaduct, between Raetiki and National Park, Nov. 2, 1982; 4 σ, 1 ♀, Makokomiko Stream on Rt 4 (1 km south of Erua), between Erua and National Park, Nov. 2, 1982; 4 σ, 7 ♀, Otupoto Stream on Rt 32,

Discussion: The structure of the cauda and fourth legs relate the present species to the following, *T. solivagus*, both differing from other known members of the genus in having a cauda nearly as wide as the body. Also, the ridges at the posterior end of the body proper are U-shaped and are placed well medial to lateral edges of body (figs. 295, 298). Females of the present species differ from other known females of the genus in not having the genital field distinctly set off from the rest of the body and in the reticulate ornamentation of the dorsal sclerites. The female of the following species, which is unknown, is expected to be very similar to that of the present female.

west of Lake Taupo, Nov. 3, 1982.

51. Tryssaturopsis solivagus, new species

(Figs. 298, 299, 302, 571)

Male: Both eye and integumental pigment well developed; dorsal shield 388 μm in length, 289μm in width; anteromedial plate bearing the postocularia; the anterolateral platelets with one pair of glandularia and the posteromedial plate with three pairs of glandularia; figure 57l shows the ornamentation of the dorsal shield; ventral shield $540\mu m$ in length, $319\mu m$ in width; anterior coxae projecting; glands of the fourth coxae located directly anterior to insertions of the fourth legs; projections associated with insertions of fourth legs somewhat pointed and with several setae on lateral margins; genital field lying on a well developed cauda whose morphology is better illustrated (fig. 298) than described; cauda 270µm in width; U-shaped ridges, partially surrounding a pair of glandularia, extending anteromedially from base of cauda and beginning well medial to posterior corners of body proper; gonopore small, simple and almost terminal; many genital acetabula present, most of which are confined to the dorsal surface (fig. 302); dorsal lengths of the palpal segments: P-I, 27μm; P-II, 48 μ m; P-III, 24 μ m; P-IV, 66 μ m; P-V, 25 μ m; palp similar to that of other members of the genus; capitulum $83\mu m$ in length; chelicera $107\mu m$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 76µm; I-Leg-5, 83µm; I-Leg-6, 86µm; dorsal lengths of the segments of the fourth leg: IV-Leg-1, 155 μ m; IV-Leg-2, 89 μ m; IV-Leg-3, 79 μ m; IV-Leg-4, 137 μ m; IV-Leg-5, 100 μ m; IV-Leg-6, 96µm; IV-Leg-2 with a somewhat pointed ventral projection; IV-Leg-4 expanded and bearing a dorsal row of setae (fig. 299).

Female: Unknown (but expected to be very similar to that of the preceding

species).

Holotype: Adult of, from Waikohatu Stream on Rt 12, in the Kauri Forest

(Waipoua State Forest), North Island, May 29, 1981.

Discussion: This species is most closely related to *T. novus* but differs in having the projection on IV-Leg-2 directed somewhat more distoventrally and the dorsal side of IV-Leg-4 with a row of setae, The cauda is less distinctly set off from the body proper in the present species (compare figures 293, 302) and the ridges on the ventral shield are different (compare figures 295, 298).

Genus PILOSATURUS, new genus

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets with one pair of glandularia; a pair of glandularia sclerites (glandularia 2) between medial corners of anterolateral and posterolateral platelets and the lateral edges of the posteromedial plate; posteromedial plate bearing two pairs of glandularia; postocularia and all dorsal glandularia on well developed tubercles (fig. 308); integument with numerous, closely packed, fine pointed projections, giving it a velvety appearance (fig. 572); posterior margins of fourth coxae extending decidedly posteromedially (figs. 309, 313); glands of the fourth coxae greatly reduced in size and well removed from suture lines between third and fourth coxae; male without a distinct cauda, although genital field region is slightly set off from the body; male fourth leg exhibiting a slight sexual dimorphism (fig. 306); coxal slots not developed; legs not laterally compressed; P-II without ventral papillae; IV-Leg-l relatively long.

Type Species: Pilosaturus villosus (Hopkins).

52. Pilosaturus villosus (Hopkins)

(Figs. 306-313, 572)

Tryssaturus villosus Hopkins, 1967. Trans. Royal Soc. New Zealand, 10:38.

Male: Eye pigment developed; dorsal shield $433\mu m$ in length, $380\mu m$ in width; anteromedial plate bearing the postocularia on small humps; anterolateral platelets with a pair of glandularia; one pair of glandularia located on small sclerites lying free in the integument; two pairs of glandularia present on posteromedial plate; all dorsoglandularia on small humps (fig. 308); with numerous, small integumental projections giving the mite a velvety appearance; ventral shield $540\mu m$ in length, 410μ m in width; anterior coxae projecting; glands of the fourth coxae very small and placed anterior to insertions of fourth legs; projections associated with insertions of fourth legs pointed and with several setae on lateral edges; genital field slightly set off from rest of body to form a very short cauda 193 \mu m in width; a pair of enlarged glandularia tubercles extending somewhat posterior to the genital field; many pairs of acetabula present; gonopore small, simple and nearly terminal in position; third, and especially the fourth, coxae projecting posteromedially, with posterior suture lines of fourth coxae extending nearly to the genital field (fig. 313); dorsal lengths of the palpal segments: P-I, 41µm; P-II, $69\mu m$; P-III, $31\mu m$; P-IV, $87\mu m$; P-V, $36\mu m$; structure of palp as shown for the female; capitulum $112\mu m$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $85\mu m$; I-Leg-5, $93\mu m$; I-Leg-6, $86\mu m$; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $145\mu m$; IV-Leg-2, $93\mu m$; IV-Leg-3, $90\mu \text{m}$; IV-Leg-4, $117\mu \text{m}$; IV-Leg-5, $121\mu \text{m}$; IV-Leg-6, $114\mu \text{m}$; fourth leg slightly modified, with IV-Leg-2 bearing a vertrally directed, thickened seta; IV-Leg-3 with three heavy setae and IV-Leg-5 somewhat swollen (fig. 306).

Female: Eye pigment developed; dorsal shield $479\mu m-498\mu m$ in length, 412 μ m-418 μ m in width; structure of dorsum as described for the male; figure 572 shows the ornamentation of the dorsal shield; ventral shield $540\mu m-577\mu m$ in length, $434\mu \text{m}$ - $440\mu \text{m}$ in width; anterior coxae projecting; glands of the fourth coxae small and placed anterior to insertions of fourth legs; projections associated with insertions of fourth legs pointed in ventral view and with three long setae on lateral margins; genital field subterminal; gonopore much larger than in male; many genital acetabula present; third and fourth coxae extending posteromedially; posterior suture lines of fourth coxae ending near genital field; figure 309 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $41\mu \text{m}-43\mu \text{m}$; P-II, $74\mu \text{m}-76\mu \text{m}$; P-III, $34\mu \text{m}-36\mu \text{m}$; P-IV, $93\mu \text{m} 95\mu m$; P-V, $40\mu m$; figure 311 shows the proportions and chaetotaxy of the palp; capitulum 114μ m- 118μ m in length; chelicera 179μ m- 183μ m in length; figure 312shows a lateral view of the capitulum and chelicera; dorsal lengths of the distal segments of the first leg: I-Leg-4, 71μ m- 76μ m; I-Leg-5, 83μ m- 86μ m; I-Leg-6, $83\mu m$; figure 310 shows the structure of these segments; fourth legs not exhibiting sexual dimorphism, i.e., no heavy setae on IV-Leg-2 and 3, and IV-Leg-5 not swollen.

Material Examined: The type locality of this species is a stream in the Taraua Mountains in southern North Island and the above description is based in part on material from this region sent to me by Dr. Ceri Hopkins. I took a female from Whale Creek on Rt 6, west of Murchison, South Island, Nov. 7, 1982.

Discussion: Although the pilose integument is unusual, it is also found in one of the species of *Piotaturus*. Most noticeable differences are the posteromedially directed third and fourth coxae (which extend nearly to the genital field) and the presence of enlarged tubercles bearing the dorsal glandularia. The sexual dimorphism of the male fourth leg, though slight, is distinctive and unlike that in any other genus of Notoaturinae.

Genus TRYSSATURUS Hopkins

Tryssaturus Hopkins, 1967. Trans. Royal Soc. New Zealand, 10: 36.

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets with one pair of glandularia; a pair of small glandularia sclerites (glandularia 2) between medial corners of anterolateral and posterolateral platelets and lateral edges of posteromedial plate; posteromedial plate with two pairs of glandularia; none of the glandularia on tubercles; dorsal sclerites with a reticulate pattern (fig. 573); coxae confined to anterior half of body; posterior suture lines of fourth coxae extending more or less at right angles to the long axis of the body (figs. 316, 318); glands of the fourth coxae of normal size and placed well posterior to suture lines between third and fourth coxae; coxal slots absent, legs not laterally compressed; P-II with a few very small ventral papillae; P-IV of nearly the same height along entire length and with a small but thickened terminal seta medially; IV-Leg-l relatively long and bearing numerous setae; male without a distinct cauda; male fourth leg exhibiting a slight sexual dimorphism consisting of a patch of setae on IV-Leg-2 and a large extension of IV-Leg-3, bearing a peg-like seta (fig. 317); female has a distal projection on IV-Leg-2 but has only two or three setae in area where male has a patch of them; female also with a short distal extension of W-Leg-3 bearing a short peg-like seta.

Type Species: Tryssaturus spinipes Hopkins.

Discussion: All other species previously assigned to *Tryssaturus* have been placed in other genera, leaving only one species.

53. Tryssaturus spinipes Hopkins

(Figs. 314-319, 573)

Tryssaturus spinipes Hopkins, 1967. Trans. Royal Soc. New Zealand, 10: 36.

Male: Eye and integumental pigmentation well developed; dorsal shield 373 μ m-395 μ m in length, 265μ m-293 μ m in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; one pair of glandularia located on free sclerites; posteromedial plate with two pairs of glandularia; male dorsal shield with the same characteristic reticulate ornamentation shown for the female (fig. 573); ventral shield 441μ m-479 μ m in length, 273 μ m-304 μ m in width; anterior coxae projecting; glands of the fourth coxae placed anteromedial to insertions of fourth legs; projections associated with insertions of fourth legs appearing somewhat pointed in ventral view and with a few long setae on lateral edges; posterior margins of fourth coxae placed at right angles to long axis of body; fourth coxae located in anterior half of body and far removed from the genital field; genital field nearly terminal; gonopore small, oval and placed near posterior end of body; many genital acetabula present; figure 316 shows the ventral shield; dorsal lengths of the palpal segments: P-I, 24μ m- 29μ m;

P-II, $49\mu\text{m}-53\mu\text{m}$; P-III, $22\mu\text{m}-24\mu\text{m}$; P-IV, $62\mu\text{m}-69\mu\text{m}$; P-V, $26\mu\text{m}-28\mu\text{m}$; structure of palp as illustrated for female; capitulum $79\mu\text{m}-83\mu\text{m}$ in length; the chelicera $104\mu\text{m}-110\mu\text{m}$ in length; structure of capitulum and chelicera much as shown for the related genus (fig. 303); dorsal lengths of the distal segments of the first leg: I-Leg-4, $65\mu\text{m}-72\mu\text{m}$; I-Leg-5, $69\mu\text{m}-76\mu\text{m}$; I-Leg-6, $69\mu\text{m}-79\mu\text{m}$; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $162\mu\text{m}$; IV-Leg-2 (to tip of distal projection) $110\mu\text{m}-118\mu\text{m}$; IV-Leg-3 (to tip of distal projection) $128\mu\text{m}-131\mu\text{m}$; IV-Leg-4, $76\mu\text{m}-79\mu\text{m}$; IV-Leg-5, $72\mu\text{m}-79\mu\text{m}$; IV-Leg-6, $72\mu\text{m}-79\mu\text{m}$; IV-Leg-2 with a long distal projection and a patch of thickened setae medially; IV-Leg-3 with a well developed distal projection which bears a short, thickened seta; figure 317 shows the proportions and chaetotaxy of the fourth leg.

Female: Dorsum as described for the male (fig. 573); dorsal shield 350μ m- 410μ m in length, 258μ m- 304μ m in width; ventral shield 411μ m- 479μ m in length, 274μ m- 304μ m in width; anterior coxae projecting; glands of the fourth coxae are placed anteromedial to insertions of fourth legs; projections associated with the insertions of fourth legs appearing pointed in ventral view; posterior margins of fourth coxae directed slightly anteromedially; fourth coxae located in anterior half of body and far removed from genital field; genital field subterminal; gonopore much longer than wide; many genital acetabula present; figure 318 shows the ventral shield; dorsal lengths of the palpal segments: P-I, 25μ m- 28μ m; P-II, 50μ m- 55μ m; P-III, 26μ m- 28μ m; P-IV, 60μ m- 69μ m; P-V, 27μ m- 31μ m; figure 319 shows the proportions and chaetotaxy of the palp; capitulum 69μ m- 79μ m in length; chelicera 100μ m- 114μ m in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 62μ m- 64μ m; I-Leg-5, 64μ m- 71μ m; I-Leg-6, 67μ m- 76μ m; figure 315 shows these segments.

Material Examined: NORTH ISLAND: 4 of, 2 ♀, from a stream on Rt 6, just north of Makatote Viaduct between Raetiki and National Park, Nov. 2, 1982; SOUTH ISLAND: 2 ♀, Whangamoa River on Rt 6, 3 km northeast of Whangamoa Saddle, Nov. 6, 1982; 9 of, 11 ♀, Whale Creek on Rt 6, west of Murchison, Nov. 7, 1982; 1 ♀, Irongate Stream on Rt 1, 24 km north of Kaikouri, Nov. 21, 1982; 1 ♂, Wakapuaka River on Rt 6, on western edge of Hira State Forest, Nov. 23, 1982.

Discussion: The characters given in the generic key are sufficient to diagnose members of both sexes of the present species. The type locality of the species is a stream in the Tararua Mountains of southern North Island but Hopkins also collected it in the Egmont area.

Genus NEOTRYSSATURUS Cook

Neotryssaturus Cook, 1974. Mem. Amer. Ent. Inst., 21: 355.

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets with one pair of glandularia; a pair of glandularia on small sclerites (glandularia 2) located between medial corners of anterolateral and posterolateral platelets and lateral edges of posteromedial plate; posteromedial plate with two pairs of glandularia; glandularia not on large tubercles; dorsal sclerites with low papillae (figs. 574, 575); coxae confined to anterior half of body; posterior margins of fourth coxae extending more or less at right angles to long axis of body (figs. 320, 324); glands of the fourth coxae of normal size and placed well posterior to suture lines between third and fourth coxae; coxal slots absent, legs not laterally compressed; P-II without ventral papillae; P-IV of nearly uniform height along entire length and with a small but thickened terminal seta medially;

IV-Leg-1 tending to be somewhat lengthened but not to the degree found in the genus *Tryssaturus*; males with a distinct cauda which is very narrow at base and then widens abruptly at posterion end (figs. 320, 336); male fourth leg exhibiting slight (fig. 327) to pronounced (fig. 322) sexual dimorphism.

Type Species: Neotryssaturus inusitatus (Hopkins)

Discussion: The present genus exhibits a number of similarities with *Tryss-aturus*. These include an almost identical morphology of the mouthparts and the coxal region. *Neotryssaturus* differs in its strong sexual dimorphism of the male body, a different dimorphism of the male fourth leg, and different ornamentation of the dorsal sclerites.

54. Neotryssaturus inusitatus (Hopkins)

(Figs. 320-325, 328, 329, 574)

Tryssaturus inusitatus Hopkins, 1967. Trans. Royal Soc. New Zealand, 10: 41. Tryssaturus (Neotryssaturus) inusitatus Cook, 1974. Mem. Amer. Ent. Inst., 21: 355.

Male: Eye pigment well developed; dorsal shield $380\mu m-394\mu m$ in length, $334\mu \text{m}$ - $357\mu \text{m}$ in width; anteromedial plate bearing the postocularia on small humps; one pair of glandularia present on anterolateral platelets; one pair of glandularia on small sclerites which lie free in the integument; two pairs of glandularia on posteromedial plate; dorsal glandularia lying on very small humps; sclerites of dorsum with numerous very small papillae and scattered larger papillae similar to those shown for the female (fig. 574); ventral shield $516\mu m-532$ μm in length, $388 \mu m$ – $395 \mu m$ in width; anterior coxae projecting; glands of the fourth coxae lying anteromedial to insertions of fourth legs; projections associated with insertions of fourth legs appearing pointed in ventral view and with a few long lateral setae; genital field located on a well developed cauda; cauda is widest $(197\mu m-206\mu m)$ near posterior end and narrowest at base; several pairs of acetabula located laterally on ventral side of cauda; gonopore nearly terminal and noticeably longer than wide; numerous setae present along lateral edges of cauda, these setae best seen in lateral view (fig. 325); posterior suture lines of fourth coxae placed at right angles to long axis of body; fourth coxae located in anterior half of body and far removed from genital field; figure 320 illustrates the ventral shield; dorsal lengths of the palpal segments: P-I, $35\mu m-36\mu m$; P-II, $69\mu \text{m} - 70\mu \text{m}$; P-III, $31\mu \text{m}$; P-IV, $93\mu \text{m} - 95\mu \text{m}$; P-V, $34\mu \text{m} - 35\mu \text{m}$; structure of palp as shown for female; capitulum $110\mu m$ in length; chelicera $148\mu m$ - $152\mu m$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $90\mu m$ -97 μ m; I-Leg-5, 103μ m- 104μ m; I-Leg-6, 91μ m- 93μ m; dorsal lengths of the distal segments of the fourth leg: IV-Leg-1, 156 \mu m; IV-Leg-2, 93 \mu m-97 \mu m; IV-Leg-3, $62\mu \text{m}$ - $72\mu \text{m}$; I-Leg-4, $176\mu \text{m}$ - $190\mu \text{m}$; I-Leg-5, $162\mu \text{m}$; I-Leg-6, $92\mu \text{m}$ - $96\mu \text{m}$; structure of fourth leg better illustrated (fig. 322) than described; figure 321 shows a slightly different view of IV-Leg-5 and 6.

Female: Dorsum as described for male (fig. 574); dorsal shield $380\mu\text{m}$ -395 μm in length, $334\mu\text{m}$ -357 μm in width; ventral shield $449\mu\text{m}$ -494 μm in length, $346\mu\text{m}$ -373 μm in width; anterior coxae projecting; glands of the fourth coxae located anteromedial to insertions of fourth legs; projections associated with insertions of fourth legs appearing pointed in ventral view and with three pairs of setae on lateral margins; posterior margins of fourth coxae directed somewhat anteromedially; fourth coxae located in anterior half of ventral shield and far re-

moved from genital field; genital field subterminal and distinctly set off from the rest of the ventral shield (fig. 324); gonopore much longer than wide; many pairs of genital acetabula present; dorsal lengths of the palpal segments: P-I, 36μ m- 37μ m; P-II, 66μ m- 68μ m; P-III, 28μ m- 31μ m; P-IV, 83μ m- 87μ m; P-V, 34μ m- 35μ m; figure 323 shows the proportions and chaetotaxy of the palp; capitulum 104μ m- 110μ m in length; chelicera 138μ m- 149μ m in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 71μ m- 76μ m; I-Leg-5, 80μ m- 87μ m; I-Leg-6, 80μ m- 87μ m; figure 328 shows these segments.

Material Examined: NORTH ISLAND: 1 of, 2 after Maikohatu Stream on Rt 12 (in the Kauri Forest), Waipoua State Forest, May 29, 1981; 1 of, same area as preceding collection on Oct. 24, 1982; 1 after April 1981; 1 and Benneydale, June 6, 1981; 1 and Benneydale, Be

on Oct. 31, 1982.

Discussion: The distinctive cauda of the male will distinguish that sex of the present species from all other notoaturins except the following species. See remarks under the latter. The female of the present species bears a superficial resemblance to that of *Tryssaturus spinipes*, but the body of the present species is more shouldered anteriorly and the genital field is more projecting (compare figures 318, 324). The ornamentation of the dorsal shield is completely different (compare figures 573, 574). See remarks under the following species for characteristics separating females of the two species in the present genus.

55. Neotryssaturus pallidus, new species

(Figs. 326, 327, 330-334, 336, 575)

Male: Integumental pigment absent but eyes well developed; dorsal shield $274\mu m$ in length, $297\mu m$ in width; anteromedial plate bearing the postocularia on small humps; one pair of glandularia on anterolateral platelets; one pair of glandularia located on small sclerites which lie free in the integument; two pairs of glandularia on the posteromedial plate; all glandularia of dorsal shield somewhat raised; integument of dorsum lacking the larger papillae characteristic of the previous species; ventral shield $395\mu m$ in length, $304\mu m$ in width; anterior coxae projecting; glands of the fourth coxae placed slightly anteromedial to insertions of fourth legs; projections associated with insertions of fourth legs appearing pointed in ventral view and with several long setae on lateral margins; genital field located on a well developed cauda; cauda widest (145 µm) at posterior end and narrowest at base of cauda; several pairs of acetabula present on ventral side of cauda; gonopore small and more or less terminal; numerous long setae on lateral margins of cauda, these best seen in lateral view (fig. 331); figures 332 and 336 show the morphology of the cauda; posterior suture lines of fourth coxae placed at right angles to long axis of body; dorsal lengths of the palpal segments: P-I, $27\mu m$; P-II, $53\mu m$; P-III, $24\mu m$; P-IV, $69\mu m$; P-V, $31\mu m$; structure of palp as shown for female; capitulum $85\mu m$ in length; chelicera $110\mu m$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $60\mu m$; I-Leg-5, $62\mu m$; I-Leg-6, $69\mu m$; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $107\mu m$; IV-Leg-2, $67\mu m$; IV-Leg-3, $69\mu m$; IV-Leg-4, $83\mu m$; IV-Leg-95, $93\mu m$; IV-Leg-6, $97\mu m$; fourth leg not as highly modified as in the previous species, its structure better illustrated (fig. 327) than described.

Female: Structure of dorsum as described for male; dorsal shield $334\mu m$ (330 μm -334 μm) in length, 304 μm in width; ornamentation of dorsal shield consisting of small papillae of more or less uniform size (fig. 575); ventral shield

 $395\mu \mathrm{m}$ in length, $312\mu \mathrm{m}$ ($312\mu \mathrm{m}$ - $319\mu \mathrm{m}$) in width; anterior coxae projecting; the glands of the fourth coxae placed anteromedial to insertions of fourth legs; projections associated with insertions of fourth legs appearing pointed in ventral view and with three long setae on lateral margins; posterior suture lines of the fourth coxae placed at right angles to long axis of body; genital field subterminal and set off into what could be termed a short cauda (fig. 333); gonopore large; several pairs of genital acetabula present; dorsal lengths of the palpal segments: P-I, $28\mu \mathrm{m}$ ($27\mu \mathrm{m}$); P-II, $53\mu \mathrm{m}$ ($51\mu \mathrm{m}$ - $52\mu \mathrm{m}$); P-III, $24\mu \mathrm{m}$ ($24\mu \mathrm{m}$ - $25\mu \mathrm{m}$); P-IV, $67\mu \mathrm{m}$ ($65\mu \mathrm{m}$ - $69\mu \mathrm{m}$); P-V, $31\mu \mathrm{m}$ ($32\mu \mathrm{m}$); figure 330 shows the proportions and chaetotaxy of the palp; capitulum $86\mu \mathrm{m}$ ($85\mu \mathrm{m}$ - $86\mu \mathrm{m}$) in length; chelicera $107\mu \mathrm{m}$ ($107\mu \mathrm{m}$ - $111\mu \mathrm{m}$) in length; figure 334 shows a lateral view the the capitulum and chelicera; dorsal lengths of the distal segments of the first leg: I-Leg-4, $53\mu \mathrm{m}$ ($55\mu \mathrm{m}$ - $57\mu \mathrm{m}$); I-Leg-5, $59\mu \mathrm{m}$ ($58\mu \mathrm{m}$ - $61\mu \mathrm{m}$); I-Leg-6, $62\mu \mathrm{m}$ ($62\mu \mathrm{m}$ - $64\mu \mathrm{m}$); figure 326 shows these segments.

Holotype: Adult of, from a tributary of the Tahakopa River on Tahakopa Rd,

5 km from Waikawa Valley Rd, South Island, Nov. 12, 1982.

Allotype: Adult \(\begin{aligned} \text{, same data as holotype.} \end{aligned} \)

Paratypes: 2 \(\frac{1}{2} \), Pourakino River at Pourakino Picnic Grounds in Longwood State Forest, on Harrington Rd south of Otautau, South Island, Nov. 13, 1982.

Discussions: The differences in morphology of the male body in the two species are numerous and are best compared by examining the illustrations (figs. 320, 336) and (figs. 329, 332). The fourth leg of the present species is less modified, with IV-Leg-4 not greatly lengthened and IV-Leg-5 not expanded at distal end. In females of the present species, the genital field is more distinctly set off from body and the first coxae do not extend as far beyond the body (compare figures 324, 333) Also, there are no enlarged, scattered papillae on the dorsal shield of the present species (compare figures 574, 575).

Genus PSEUDOTRYSSATURUS, new genus

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets bearing one pair of glandularia; a pair of glandularia on small sclerites between medial corners of anterolateral and posterolateral platelets and lateral edges of posteromedial plate; posteromedial plate bearing two pairs of glandularia; ornamentation of dorsal sclerites variable, they may be papillate, lined, reticulate or ornamentation may be nearly absent; a cauda absent, although the genital field area tends to be distinctly set off from remainder of ventral shield; with rare exceptions, an anterior pair of pore plates occupying a common concavity (fig. 603); coxae confined to anterior half of body; posterior suture lines of fourth coxae usually not evident but, if developed, they extend more or less at right angles to long axis of body; glands of the fourth coxae placed near the suture lines between third and fourth coxae; projections associated with insertions of fourth legs appearing somewhat pointed in ventral view and with a few setae laterally; coxal slots absent, legs not laterally compressed; P-II with a few small ventral papillae; P-IV of nearly same height along entire length and with a small but thickened terminal seta on medial side; I-Leg-l only moderately elongated and with only a few setae; male fourth leg exhibiting a slight to moderate sexual dimorphism consisting of greater expansion of the leg segments and distal projections on certain segments; the leg setae do not exhibit sexual dimorphism.

Type Species: Pseudotryssaturus indentatus (Hopkins).

Discussion: Pseudotryssaturus shows a number of characteristics also pres-

ent in *Tryssaturus* and *Neotryssaturus*. These include a rather similar morphology of the coxal region, dorsal shield and mouthparts. There is also a tendency for the genital field region to be set off from the remainder of the body but only in *Neotryssaturus* is there a well developed cauda in the male. One difference found only in *Pseudotryssaturus* is the type of male sexual dimorphism of the fourth leg. In the present genus, this dimorphism is confined to proportions of the segments and the setae are unmodified. Another difference is the tendency for a pair of pore plates on each side to share a common concavity (acetabulum). It must be referred to as a tendency as, although there are usually a complete pair of these unusual acetabula on each side, there may occasionally be the double set of pore plates on only one side or rarely none of the acetabula are double.

KEY TO THE NEW ZEALAND SPECIES OF PSEUDOTRYSSATURUS

1.	Ornamentation of the posteromedial plate of the dorsal shield consisting of distinct longitudinal lines (figs. 580, 583) or exhibiting varying degrees of loss of any surface ornamentation (figs. 581, 582); a pair of small but distinct apophyses near posteromedial suture lines between third and fourth coxae; males with a somewhat curved extension of IV-Leg-4 and, to a lesser degree, IV-Leg-3 (fig. 369)
2.	Both anteromedial and posteromedial plates of dorsum unlined (fig. 581); body very narrow (figs. 382, 383) and eye pigment reduced Pseudotryssaturus planus, new species(p. 79) Either only anteromedial plate lined (fig. 582) or both anteromedial and posteromedial plates lined (figs. 580, 583); body comparatively wider (figs. 367, 375); eye pigment well developed
3.	Larger species (males 578µm-668µm in length, females 471µm-623µm in length); both anteromedial and posteromedial plates lined; integumental pigment present; segments of male fourth leg relatively long and IV-Leg-6 only slightly expanded distally (fig. 372) Pseudotryssaturus indentatus (Hopkins)(p. 77) Smaller species (males 501µm-562µm in length, females 464µm-532µm in length); posteromedial plate may lack lines; no integumental pigment present; segments of male fourth leg relatively short and stocky, with IV-Leg-6 expanded distally (fig. 369) Pseudotryssaturus anchistus, new species(p. 78)
4.	Ornamentation of the posteromedial plate of the dorsum in the form of distinct papillae rather than reticulations (fig. 584) Pseudotryssaturus papillidermis, new species .(p. 81) Ornamentation of the posteromedial plate appearing as reticulations rather than papillae (figs. 585-587)

5. Female gonopore very small, its length less than one-third width of genital field (fig. 408); male ventral shield narrowed medially and with a patch of several short, thickened setae on each side posterior to epimeroglandularia 2 (fig. 401)

Pseudotryssaturus dapsilus, new species ... (p. 84)
Female gonopore larger, its length at least one-half width of the genital field (figs. 392, 398); male ventral shield not narrowed medially and with no thickened setae near epimeroglandularia 2 6

6. Posterior suture lines of fourth coxae tending to be well developed in female (and often in male) (fig. 392); female gonopore very large, its length approximately that of capitular bay; anteromedial plate with integumental pigmentation in both sexes; male genital field with a slight indentation posteromedially (fig. 388)

Pseudotryssaturus dictydermis, new species .(p. 81)
Posterior suture lines of fourth coxae mostly obliterated in both sexes (figs. 398, 400); female gonopore large but its length less than length of capitular bay; no integumental pigmentation; male genital field roundly pointed posteriorly (fig. 400)

Pseudotryssaturus acutus, new species .. (p. 83)

56. Pseudotryssaturus indentatus (Hopkins)

(Figs. 362-365, 367, 372, 580, 603)

Tryssaturus indentatus Hopkins, 1967. Trans. Royal Soc. New Zealand 10: 38.

Male: Eye and integumental pigmentation well developed; dorsal shield 456 $\mu m - 532 \mu m$ in length, $319 \mu m - 395 \mu m$ in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; one pair of glandularia on small sclerites lying free in the integument; posteromedial plate with two pairs of glandularia; dorsal shield with numerous interconnected small papillae which are arranged in definite longitudinal lines on the posteromedial plate but more reticulate on other sclerites; this ornamentation shown in figure 367 but better indicated in the photograph of the female dorsal shield (fig. 580); ventral shield $578\mu\text{m}$ - $668\mu\text{m}$ in length, $342\mu\text{m}$ - $410\mu\text{m}$ in width; anterior coxae projecting; glands of the fourth coxae shifted to a position close to the suture lines between third and fourth coxae; projections associated with insertions of fourth legs bluntly pointed in ventral view and bearing several setae; posterior margins of fourth coxae obliterated except for an area immediately medial to the insertions of the fourth legs; small apophyses present medial to glands of fourth coxae; genital field set off from remainder of body; a ridge on each side extending far anterior to the genital field (fig. 363); gonopore somewhat angular and nearly terminal; genital acetabula numerous; one pair of anterior acetabula with doubled pore plates; dorsal lengths of the palpal segments: P-I, 31μ m- 35μ m; P-II, $62\mu m - 67\mu m$; P-III, $31\mu m - 34\mu m$; P-IV, $79\mu m - 90\mu m$; P-V, $27\mu m - 31\mu m$; palp as shown for the female; capitulum $93\mu m$ - $100\mu m$ in length; chelicera 138 μm-149μm in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $87\mu\text{m}$ - $100\mu\text{m}$; I-Leg-5, $83\mu\text{m}$ - $97\mu\text{m}$; I-Leg-6, $93\mu\text{m}$ - $100\mu\text{m}$; dorsal lengths of the segments of the fourth leg (those of segments 2, 3 and 4 to distal end of distal projections): IV-Leg-1, 121μ m- 145μ m; IV-Leg-2, 114μ m- 124μ m; IV-Leg-3, $93\mu\text{m}-97\mu\text{m}$; IV-Leg-4, $121\mu\text{m}-141\mu\text{m}$; IV-Leg-5, $86\mu\text{m}-100\mu\text{m}$; IV-Leg-6, 79μm-86μm; IV-Leg-6 not greatly expanded distally; figure 372 shows the proportions and chaetotaxy of the fourth leg.

Female: Dorsum as described for male; dorsal shield $380\mu\text{m}-501\mu\text{m}$ in length, $273\mu\text{m}-380\mu\text{m}$ in width; figure 580 shows the characteristic ornamentation of dorsal shield; ventral shield $471\mu\text{m}-623\mu\text{m}$ in length, $289\mu\text{m}-395\mu\text{m}$ in width; anterior coxae projecting; glands of the fourth coxae near suture lines between third and fourth coxae; projections associated with insertions of fourth legs bluntly pointed in ventral view and bearing a few setae; posterior suture lines of fourth coxae obliterated; small apophyses present somewhat posteromedial to glands of fourth coxae; gonopore subterminal and longer than wide; genital acetabula numerous and with a tendency for an anterior pair to have double pore plates; figure 365 shows the ventral shield; dorsal lengths of the palpal segments: P-I, $24\mu\text{m}-31\mu\text{m}$; P-II, $55\mu\text{m}-68\mu\text{m}$; P-III, $26\mu\text{m}-36\mu\text{m}$; P-IV, $72\mu\text{m}-86\mu\text{m}$; P-V, $24\mu\text{m}-27\mu\text{m}$; figure 362 shows the structure of the palp; capitulum $87\mu\text{m}-104\mu\text{m}$ in length; chelicera $128\mu\text{m}-148\mu\text{m}$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $62\mu\text{m}-86\mu\text{m}$; I-Leg-5, $67\mu\text{m}-79\mu\text{m}$; I-Leg-6, $76\mu\text{m}-86\mu\text{m}$; figure 364 shows these segments.

Material Examined: Over 1400 specimens of this species were taken. It was present in nearly two-thirds of the collections and was present throughout both North and South Islands. Because it is to be expected nearly everywhere, no

specific localities are given.

Discussion: There is a large size variation, especially among females but, since there are all size gradations, even within a single population, it seems very probable they all belong to a single species.

57. Pseudotryssaturus anchistus, new species

(Figs. 366, 368-371, 373-376, 582, 583)

Male: Integumental pigment absent, eye pigment slighly reduced; dorsal shield $422\mu\mathrm{m}$ ($410\mu\mathrm{m}$ - $456\mu\mathrm{m}$) in length, $273\mu\mathrm{m}$ ($258\mu\mathrm{m}$ - $297\mu\mathrm{m}$) in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; a pair of glandularia on small sclerites lying free in the integument; posteromedial plate with two pairs of glandularia; striations of dorsal shield are variable; anteromedial plate typically with well developed striations (fig. 376) but posteromedial plate varying from no striations to completely covered with striations; this ornamentation best seen in the photographs of the female dorsal shield (figs. 582, 583); ventral shield $532\mu m$ ($501\mu m-562\mu m$) in length, $288\mu m$ $(274\mu m-304\mu m)$ in width; anterior coxae projecting; glands of the fourth coxae located near suture lines between third and fourth coxae; projections associated with insertions of fourth legs bluntly pointed in ventral view and bearing several setae; posterior suture lines of fourth coxae obliterated; small apophyses present somewhat posteromedial to glands of fourth coxae; genital field set off from remainder of body; a ridge on either side extending anteriorly from the genital field (but not nearly as far anteriorly as in indentatus); gonopore somewhat angular and more or less terminal; genital acetabula numerous; one anteromedially located pair of acetabula with doubled pore plates; figure 368 shows a posteroventral view of the genital field; dorsal lengths of the palpal segments: P-I, 27 μm (27 μm -34 μm); P-II, 62 μm (60 μm -62 μm); P-III, 27 μm (27 μm -31 μm); P-IV, $78\mu \text{m}$ ($76\mu \text{m}$ - $83\mu \text{m}$); P-V, $28\mu \text{m}$ ($27\mu \text{m}$ - $31\mu \text{m}$); palp similar to that of the female; capitulum $90\mu m$ ($86\mu m$ – $93\mu m$) in length; chelicera $131\mu m$ ($118\mu m$ – $138\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $83\mu m$ $(76\mu \text{m}-90\mu \text{m})$; I-Leg-5, $93\mu \text{m}$ $(87\mu \text{m}-96\mu \text{m})$; I-Leg-6, $104\mu \text{m}$ $(93\mu \text{m}-107\mu \text{m})$; dorsal lengths of the segments of the fourth leg (those of segments 2, 3 and 4 to

distal end of distal projections): IV-Leg-1, $104\mu m$ ($93\mu m$ - $114\mu m$); IV-Leg-2, $93\mu m$ ($86\mu m$ - $93\mu m$); IV-Leg-3, $83\mu m$ ($83\mu m$ - $90\mu m$); IV-Leg-4, $111\mu m$ ($107\mu m$ - $121\mu m$); IV-Leg-5, $86\mu m$ ($80\mu m$ - $93\mu m$); IV-Leg-6, $83\mu m$ ($76\mu m$ - $83\mu m$); leg segments comparatively stocky, with IV-Leg-6 noticeably expanded distally (fig. 369).

Female: Dorsum as described for male; dorsal shield $425 \mu m$ ($388 \mu m$ -440 μ m) in length, 278μ m (258μ m- 297μ m) in width; figures 582 and 583 show the variation in ornamentation of the dorsal shield; ventral shield $509\mu m$ ($468\mu m$ - $532\mu m$) in length, $288\mu m$ ($258\mu m$ - $297\mu m$) in width; anterior coxae projecting; glands of the fourth coxae placed near suture lines between third and fourth coxae; projections associated with insertions of fourth legs bluntly pointed when they are viewed ventrally and bearing a few setae; posterior suture lines of fourth coxae obliterated; small apophyses present somewhat posteromedial to glands of fourth coxae; gonopore subterminal and longer than wide; genital acetabula numerous; with a tendency to have a pair of anterior acetabula with doubled pore plates; figure 366 shows a posteroventral view of genital field; dorsal lengths of the palpal segments: P-I, $29\mu m$ ($26\mu m$ - $31\mu m$); P-II, $59\mu m$ ($54\mu m$ - $62\mu m$); P-III, $27\mu \text{m}$ (26 μm -31 μm); P-IV, $72\mu \text{m}$ (69 μm -79 μm); P-V, $28\mu \text{m}$ (26 μm -31 μm); figure 371 illustrates the palp; capitulum $88\mu m$ ($80\mu m$ - $90\mu m$) in length; chelicera $131\mu m$ ($117\mu m$ - $134\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $74\mu \text{m}$ ($66\mu \text{m}$ - $76\mu \text{m}$); I-Leg-5, $79\mu \text{m}$ ($72\mu \text{m}$ - $79\mu \text{m}$); I-Leg-6, 89 μm (80 μm -93 μm); figure 370 illustrates these segments.

Holotype: Adult of, from Adamson Creek on Rt 6, between Lake Ianthe and

Wanganui, South Island, Nov. 9, 1982.

Allotype: Adult \angle, same data as holotype.

Paratypes: SOUTH ISLAND: 1 of, from Four Mile River on Rt. 6, between Charleston and Tiromoana, Nov. 8, 1982; 4 of, 8 \(\text{?}\), same data as holotype; 12 of, 7 \(\text{?}\), Potters Creek on Rt 6, between Bruce Bay and Lake Paringa (north of Haast), Nov. 10, 1982; 1 \(\text{?}\), Cole Creek on Rt 6, between Lake Moeraki and Haast, Nov. 10, 1982; 1 \(\text{?}\), from Boyd Creek on Rt 94, 76 km south of Milford Sound, Nov. 14, 1982; 1 \(\text{?}\), Pariwhakaoho River on Rt 60, 14 km northwest of Takaka, Nov. 24, 1982.

Discussion: The present species is most closely related to the following species, both of which differ most noticeably from the preceding species, *P. indentatus*, in lacking integumental pigmentation and in having the male IV-Leg-6 greatly expanded distally.

58. Pseudotryssaturus planus, new species

(Figs. 377-380, 382, 383, 581)

Male: Integumental pigmentation absent, eye pigment reduced; dorsal shield $410\mu\mathrm{m}$ ($410\mu\mathrm{m}$ - $441\mu\mathrm{m}$) in length, $243\mu\mathrm{m}$ ($243\mu\mathrm{m}$ - $273\mu\mathrm{m}$) in width; anteromedial plate bearing the postocularia; anterolateral platelets with a pair of glandularia; one pair of glandularia on small sclerites lying free in the integument; posteromedial plate with two pairs of glandularia; both anteromedial and posteromedial plates without longitudinal striations (fig. 377); ventral shield $502\mu\mathrm{m}$ ($516\mu\mathrm{m}$ - $555\mu\mathrm{m}$) in length, $251\mu\mathrm{m}$ ($258\mu\mathrm{m}$ - $273\mu\mathrm{m}$) in width; anterior coxae broader and less projecting than in the previous species; glands of the fourth coxae placed near suture lines between third and fourth coxae; small apophyses present posteromedial to these glands; projections associated with insertions of fourth legs blunt and bearing two setae on lateral margins; posterior suture lines of fourth

coxae obliterated; genital field slightly set off from remainder of body; short ridges on each side extending anteriorly from genital field; gonopore somewhat angular and more or less terminal; genital acetabula numerous; one pair of anteriorly located acetabula typically with doubled pore plates; figure 383 illustrates the ventral shield; dorsal lengths of the palpal segments: P-I, $26\mu m$ (27 μm -31 μm); P-II, $59\mu m$ ($57\mu m$ -65 μm); P-III, $31\mu m$ ($28\mu m$ -31 μm); P-IV, $72\mu m$ ($69\mu m$ -72 μm); P-V, $27\mu m$ ($26\mu m$ -27 μm); palp similar to that illustrated for the female; capitulum $86\mu m$ ($79\mu m$ -86 μm) in length, chelicera $128\mu m$ ($114\mu m$ -124 μm) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $79\mu m$ ($79\mu m$ -86 μm); I-Leg-5, $86\mu m$ ($86\mu m$ -90 μm); I-Leg-6, $97\mu m$ ($90\mu m$ -93 μm); dorsal lengths of the segments of the fourth leg (those of segments 2, 3 and 4 to distal end of distal projection): IV-Leg-1, $93\mu m$ ($100\mu m$ -107 μm); IV-Leg-2, $76\mu m$ ($100\mu m$ -86 μm); IV-Leg-3, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-4, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-5, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-6, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-7, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-8, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -107 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -100 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -100 μm); IV-Leg-9, $100\mu m$ ($100\mu m$ -100 μm); IV-Leg-10, $100\mu m$ ($100\mu m$ -100 μm); IV-Leg-10, $100\mu m$ ($100\mu m$ -100 μm); IV-Leg-10, $100\mu m$ ($100\mu m$ -100

380 shows the proportions and chaetotaxy of the fourth leg.

Female: Dorsum as described for male; dorsal shield 380µm (380µm-403) μ m) in length, 258 μ m (243 μ m-258 μ m) in width; figure 581 illustrates the ornamentation of the dorsal sclerites; ventral shield $471\mu m$ ($456\mu m-501\mu m$) in length, $243\mu \text{m}$ ($243\mu \text{m}$ - $266\mu \text{m}$) in width; anterior coxae wider and less projecting than in the previous species; glands of the fourth coxae located near suture lines between third and fourth coxae; small apophyses present posteromedial to these glands; projections associated with insertions of fourth legs bluntly pointed in ventral view and bearing two setae on each lateral margin; posterior suture lines of fourth coxae obliterated; gonopore subterminal and somewhat longer than wide; genital acetabula numerous, with a tendency for an anteromedial pair to have doubled pore plates; figure 382 shows the morphology of the ventral shield; dorsal lengths of the palpal segments: P-I, 27μm (27μm-28μm); P-II, 58μm (52μm- $56\mu m$); P-III, $31\mu m$ ($27\mu m$ - $29\mu m$); P-IV, $71\mu m$ ($67\mu m$ - $69\mu m$); P-V, $27\mu m$ ($27\mu m$); μ m-28 μ m); figure 379 shows the structure of the palp; capitulum 81μ m (81μ m- $83\mu\mathrm{m}$) in length, chelicera $124\mu\mathrm{m}$ ($114\mu\mathrm{m}$ - $124\mu\mathrm{m}$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $67\mu m$ ($69\mu m$ - $70\mu m$); I-Leg-5, $69\mu m$ $(72\mu \text{m}-76\mu \text{m})$; I-Leg-6, $76\mu \text{m}$ $(83\mu \text{m})$; figure 378 shows these segments.

Holotype: Adult of, from Te Whaiau Stream at junction of Rt 47 and Rotoaria

Rd, North Island, June 5, 1981.

Allotype: Adult \mathcal{P} , same data as holotype.

Paratypes: NORTH ISLAND: 1 \(\frac{1}{2} \), from stream at Opato Bridge in "Gorge" southeast of Opotiki, June 3, 1981; 2 \(\frac{1}{2} \), same data as holotype; 1 \(\frac{1}{2} \), Torere River at Torere, on Rt 35 north of Opotiki, Oct. 28, 1982; 1 \(\frac{1}{2} \), stream at Owhiritoa Bridge on Rt 2, in the "Gorge" south of Opotiki, Oct. 29, 1982; 2 \(\frac{1}{2} \), stream at Omaukoro Bridge on Rt 2, in "Gorge" south of Opotiki, Oct. 29, 1982; 1 \(\frac{1}{2} \), from a stream at Gerrards Bridge on Rt 2, in "Gorge" south of Opotiki, Oct. 29, 1982; SOUTH ISLAND: 2 \(\frac{1}{2} \), from a tributary of Wakamarina River 7 km southeast of Canvastown (off Rt 6), Nov. 5, 1982; 1 \(\frac{1}{2} \), from a tributary of Whangamoa River slightly west of Rai Saddle (at Collins Valley Picnic Grounds), Nov. 6, 1982; 1 \(\frac{1}{2} \), Kaituna River on Rt 6, 5 km south of Havelock, Nov. 22, 1982.

Discussion: This species is most closely related to the preceding, P. anchistus. Both are interstitial species with the integumental pigment absent and IV-Leg-6 of the male fourth leg expanded distally (figs. 369, 380). Differences between the two species include broader anterior coxae and a proportionally narrower body in the present species and both anteromedial and posteromedial plates lack striations in planus. Based on present knowledge of distributions, P. planus is confined to North Island and the extreme northern portion of South Island. P.

anchistus has been only collected farther south on South Island.

59. Pseudotryssaturus papillidermis, new species

(Figs. 381, 384, 385, 387, 389, 390, 584)

Male: Integumental pigmentation absent, eye pigment developed; dorsal shield $460\mu m$ ($456\mu m$) in length, $384\mu m$ ($365\mu m$) in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; a pair of small glandularia sclerites lying free in the integument; posteromedial plate with two pairs of glandularia; ornamentation of the dorsum consisting of scattered papillae which do not form distinct reticulations (fig. 584); ventral shield $608\mu m$ (592 μm) in length, $395\mu m$ (380 μm) in width; anterior coxae projecting; glands of the fourth coxae placed near suture lines between third and the fourth coxae; no apophyses (typical of the previous three species) present posteromedial to these glands; projections associated with insertions of fourth legs somewhat truncate; posterior suture lines of fourth coxae obliterated; genital field distinctly set off from remainder of body; gonopore oval and subterminal; genital field with a distinct medial indentation posteriorly; genital acetabula numerous; one pair of anterior acetabula typically with doubled pore plates; figure 390 shows the ventral shield; dorsal lengths of the palpal segments: P-I, 26 μ m (31 μ m); P-II, 60 μ m (65 μ m); P-III, 29 μ m (28 μ m); P-IV, 80 μ m (88 μ m); P-V, $30\mu m$ ($31\mu m$); palp as shown for the female; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $117\mu m$ ($131\mu m$); IV-Leg-2, $93\mu m$ ($90\mu m$); IV-Leg-3, $86\mu \text{m}$ (90 μm); IV-Leg-4, $89\mu \text{m}$ (93 μm); IV-Leg-5, $86\mu \text{m}$; IV-Leg-6, $86\mu \text{m}$ (87) μ m); fourth leg relatively unmodified and without the distal projections found in males of the previous species; figure 381 shows the structure of the fourth leg.

Female: Dorsum as described for male (fig. 584); dorsal shield $464\mu m$ (426) μ m-456 μ m) in length, 380 μ m (354 μ m-388 μ m) in width; ventral shield 601 μ m $(550\mu \text{m}-608\mu \text{m})$ in length, $384\mu \text{m}$ $(365\mu \text{m}-399\mu \text{m})$ in width; ventral shield, except for genital field region, as described for male; gonopore subterminal and longer than wide; genital acetabula numerous; an anteromedial pair of acetabula typically with doubled pore plates; figure 385 illustrates the ventral shield; dorsal lengths of the palpal segments: P-I, $31\mu m$ ($28\mu m-29\mu m$); P-II, $65\mu m$ ($60\mu m 62\mu m$); P-III, $29\mu m$ ($27\mu m$ - $29\mu m$); P-IV, $81\mu m$ ($76\mu m$ - $83\mu m$); P-V, $31\mu m$ (28) μ m-30 μ m); figure 389 shows the structure of the palp; capitulum 90 μ m (87 μ m- $91\mu m$) in length; chelicera $131\mu m$ ($128\mu m$ - $135\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $76\mu m$ ($72\mu m$ - $79\mu m$); I-Leg-5, $79\mu m$ $(74\mu\text{m}-79\mu\text{m})$; I-Leg-6, $83\mu\text{m}$ $(83\mu\text{m}-86\mu\text{m})$; figure 387 illustrates these seg-

ments.

Holotype: Adult of, from the Pariwhakaoho River on Rt 60, 14 km northwest of Takaka, South Island, Nov. 24, 1982.

Allotype: Adult ♀, same data as holotype.

Paratypes: SOUTH ISLAND: 1 of, Potters Creek on Rt 6, between Bruce Bay and Lake Paringa (north of Haast), Nov. 10, 1982; 2 9, same data as holotype.

Discussion: The papillate dorsal ornamentation is diagnostic for the present species.

60. Pseudotryssaturus dictydermis, new species

(Figs. 386, 388, 391-393, 395, 587)

Male: Both integumental and eye pigmentation developed; dorsal shield 425 μm (395 μm -425 μm) in length, 300 μm (282 μm -304 μm) in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; a pair of glandularia on small sclerites lying free in the integument; posteromedial plate bearing two pairs of glandularia; ornamentation of the dorsal shield consisting of a closely set pattern of reticulations (figs. 386, 587); ventral shield $517\mu m$ (490 μm - $532\mu m$) in length, $312\mu m$ (289 μm - $319\mu m$) in width; anterior coxae projecting; glands of the fourth coxae located near suture lines between third and fourth coxae; no apophyses present posteromedial to these glands; projections associated with insertions of fourth legs roundly pointed in ventral view; posterior suture lines of fourth coxae well indicated; genital field distinctly set off from remainder of body; gonopore oval and subterminal; genital field with a slight median indentation posteriorly; genital acetabula numerous, with one pair of acetabula typicaly with doubled pore plates; figure 388 illustrates the ventral shield; dorsal lengths of the palpal segments: P-I, $28\mu m$ ($26\mu m$ -28 μ m); P-II, 65 μ m (59 μ m-66 μ m); P-III, 27 μ m (27 μ m-29 μ m); P-IV, 81 μ m (78 μ m- $80\mu \text{m}$); P-V, $25\mu \text{m}$ ($26\mu \text{m}$ - $27\mu \text{m}$); palp as shown for the female; capitulum 79 μm (79 μm -86 μm) in length; chelicera 126 μm (124 μm -131 μm) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $79\mu m$ ($76\mu m$ - $80\mu m$); I-Leg-5, $79\mu m$ ($76\mu m$ - $79\mu m$); I-Leg-6, $87\mu m$ ($89\mu m$ - $90\mu m$); dorsal lengths of the segments of the fourth leg: IV-Leg-1, $97\mu m$ ($90\mu m$ - $100\mu m$); IV-Leg-2, $79\mu m$ $(69\mu \text{m}-83\mu \text{m}); \text{ IV-Leg-3}, 72\mu \text{m} (66\mu \text{m}-76\mu \text{m}); \text{ IV-Leg-4}, 76\mu \text{m} (76\mu \text{m}-83\mu \text{m});$ W-Leg-5, $76\mu m$ ($72\mu m-79\mu m$); W-Leg-6, $86\mu m$ ($83\mu m-89\mu m$); fourth leg relatively unmodified; figure 395 shows the proportions and chaetotaxy of the fourth leg.

Female: Dorsum as described for male; figure 587 illustrates the ornamentation of the dorsum; dorsal shield $441\mu m$ ($426\mu m-470\mu m$) in length, $334\mu m$ $(334\mu \text{m}-350\mu \text{m})$ in width; ventral shield $532\mu \text{m}$ ($517\mu \text{m}-562\mu \text{m}$) in length, 338 μm (338 μm -364 μm) in width; ventral shield, except for genital field region, as described for the male; gonopore proportionally very large and is subterminal; genital acetabula numerous with one anterior pair often doubled, but not in the individual illustrated (fig. 392); dorsal lengths of the palpal segments: P-I, 27 μm (27 μm -28 μm); P-II, 67 μm (62 μm -71 μm); P-III, 28 μm (27 μm -29 μm); P-IV, $83\mu \text{m}$ ($81\mu \text{m}$ - $85\mu \text{m}$); P-V, $27\mu \text{m}$ ($26\mu \text{m}$ - $27\mu \text{m}$); figure 391 shows the proportions and chaetotaxy of the palp; capitulum $90\mu m$ ($83\mu m$ - $93\mu m$) in length, chelicera $142\mu m$ ($141\mu m$ - $145\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $72\mu m$ ($72\mu m$ - $76\mu m$); I-Leg-5, $76\mu m$ ($72\mu m$ - $76\mu m$); I-Leg-6, 78 μm (30 μm -86 μm); figure 393 illustrates these segments.

Holotype: Adult of, MacLennan River at bridge on Aurora Creek Rd (Catlin State Forest area) between Puketiro and Rt 92, South Island, Nov. 12, 1982.

Allotype: Adult 9, same data as holotype.

Paratypes: SOUTH ISLAND: 7 of, 26 \, same data as holotype; 1 of, 1 \, from a tributary of the Tahakopa River on Tahakopa Rd, 5 km from Waikawa Valley Rd, Nov. 12, 1982; 1 of, 3 af, Pourakino River at Pourakino Picnic Grounds (in Longwood State Forest), on Harrington Rd south of Otautau, Nov. 13, 1982; 3 o, 4 ♀, from a small stream on Rt 94 west of Mossburn, Nov. 13, 1982; 4 ♀, from Flaxy Creek near the Manapouri fork off Rt 94, Nov. 13, 1982.

Discussion: The present species, the preceding species, and the following species, form a group of closely related mites characterized by little or no sexual dimorphism of the male fourth leg, lack of apophyses on the ventral shield and a non-lined integumental ornamentation. In addition to characters given in the key to separate these three species, the present taxon is the only one with an integumental color pattern. All members of this species group are apparently confined to South Island and the present species has the most extreme south-

ern range.

61. Pseudotryssaturus acutus, new species

(Figs. 394, 396-400, 586)

Male: Integumental pigment absent, eye pigment developed; dorsal shield $426\mu\mathrm{m}$ (395 $\mu\mathrm{m}$ -456 $\mu\mathrm{m}$) in length, $342\mu\mathrm{m}$ (308 $\mu\mathrm{m}$ -380 $\mu\mathrm{m}$) in width; anteromedial plate bearing the postocularia; anterolateral platelets with a pair of glandularia; one pair of glandularia on small sclerites lying free in the integument; posteromedial plate with two pairs of glandularia; ornamentation of dorsal shield consisting of low papillae which are united to form a reticulate network as shown for the female (fig. 586); ventral shield $577\mu m$ ($536\mu m-653\mu m$) in length, 365 μm (312 μm -410 μm) in width; anterior coxae projection; glands of the fourth coxae placed near suture lines between third and fourth coxae; no apophyses present posteromedial to these glands; projections associated with openings for insertion of fourth legs relatively broad and truncate; posterior suture lines of fourth coxae obliterated; genital field distinctly set off from remainder of body; gonopore small, longer than wide, and subterminal; no median indentation at posterior end of body (fig. 400); genital acetabula numerous, one pair of acetabula tending to have doubled pore plates; dorsal lengths of the palpal segments: P-I, 31 µm (31 μ m-35 μ m); P-II, 66 μ m (62 μ m-69 μ m); P-III, 28 μ m (26 μ m-34 μ m); P-IV, 79 μ m $(76\mu \text{m}-85\mu \text{m})$; P-V, $29\mu \text{m}$ $(26\mu \text{m}-28\mu \text{m})$; palp as shown for the female; capitulum $104\mu m$ ($90\mu m$ - $107\mu m$) in length; chelicera $138\mu m$ ($135\mu m$ - $160\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $86\mu m$ ($83\mu m$ -87 μ m); I-Leg-5, 90 μ m (86 μ m-90 μ m); I-Leg-6, 93 μ m; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $100\mu m$ ($97\mu m$ - $111\mu m$); IV-Leg-2, $76\mu m$ (72 μ m-93 μ m); IV-Leg-3, 79 μ m (74 μ m-76 μ m); IV-Leg-4, 86 μ m (81 μ m-93 μ m); IV-Leg-5, $83\mu m$ ($79\mu m$ - $85\mu m$); IV-Leg-6, $90\mu m$ ($86\mu m$); fourth leg relatively unmodified; figure 394 shows the proportions and chaetotaxy of the fourth leg.

Female: Dorsum as described for male (fig. 586); dorsal shield 440 µm $(410\mu m-502\mu m)$ in length, $364\mu m$ $(319\mu m-395\mu m)$ in width; ventral shield 562 μm (532 μm -631 μm) in length, 365 μm -410 μm) in width; ventral shield, except for genital field region, as described for male; gonopore relatively large and subterminal; genital acetabula numerous; anterior pair of acetabula typically with a double pore plate; figure 398 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $29\mu m$ ($27\mu m$ - $34\mu m$); P-II, $66\mu m$ $(62\mu \text{m}-69\mu \text{m}); \text{ P-III}, 30\mu \text{m} (28\mu \text{m}-32\mu \text{m}); \text{ P-IV}, 83\mu \text{m} (76\mu \text{m}-86\mu \text{m}); \text{ P-V},$ $28\mu \text{m}$ ($24\mu \text{m}$ - $28\mu \text{m}$); figure 397 shows the structure of the palp; capitulum 100 μm (93 μm -104 μm) in length, chelicera 145 μm (142 μm -155 μm) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $78\mu m$ ($72\mu m$ - $81\mu m$); I-Leg-5, $83\mu m$ ($76\mu m$ - $81\mu m$); I-Leg-6, $93\mu m$ ($79\mu m$ - $90\mu m$); figure 399 illustrates these segments.

Holotype: Adult of, from Adamson Creek on Rt 6, between Lake Ianthe and Wanganui, South Island, Nov. 9, 1982.

Allotype: Adult \(\begin{aligned} \text{, same data as holotype.} \end{aligned} \)

Paratypes: SOUTH ISLAND: 1 of, from a tributary of the Motupiko River on Rt 6, between Korere and Glenhope, Nov. 7, 1982; 3 of, Whale Creek on Rt 6, west of Murchison, Nov. 7, 1982; 1 of, Kararoa Creek on Rt. 6, between Barrytown and Nine Mile Village, Nov. 8, 1982; 2 of, 8 \, same data as holotype; 7 of, 9 9, Potters Creek on Rt 6, between Bruce Bay and Lake Paringa (north of Haast), Nov. 10, 1982; 1 of, tributary of Motupiko River on Rt 6, between Korere and Glenhope, Nov. 25, 1982; 5 of, 3 9, Hope River on Rt 6, between Glenhope and Kawatiri, Nov. 25, 1982.

62. Pseudotryssaturus dapsilus, new species

(Figs. 401-404, 406, 408, 585)

Male: Eye pigment well developed; integumental pigment typically well developed to produce darkly colored individuals, but this pigment exhibiting various degrees of lightening to produce nearly colorless individuals; dorsal shield $532\mu\mathrm{m}$ ($486\mu\mathrm{m}$ - $562\mu\mathrm{m}$) in length, $319\mu\mathrm{m}$ ($289\mu\mathrm{m}$ - $334\mu\mathrm{m}$) in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; a pair of glandularia on small sclerites lying free in the integument; posteromedial plate with two pairs of glandularia; ornamentation of dorsal shield consists of closely set reticulations as shown for the female (fig. 585); ventral shield $654\mu\mathrm{m}$ ($623\mu\mathrm{m}$ – $714\mu\mathrm{m}$) in length, $364\mu\mathrm{m}$ ($327\mu\mathrm{m}$ – $403\mu\mathrm{m}$) in width; anterior coxae projecting; glands of the fourth coxae located near suture lines between third and fourth coxae; no apophyses located posteromedial to these glands; central area of ventral shield decidedly concave; projections associated with the insertions of fourth legs extending lateral to edges of ventral shield; with numerous setae on and anterior to these projections; posterior suture lines of fourth coxae obliterated; two groups of short, thickened setae present posterior to the epimeroglandularia 2; genital field distinctly set off from remainder of body; gonopore small and appearing nearly circular in ventral view; a median notch present posterior to genital field; genital acetabula numerous, with an anterior pair tending to have doubled pore plates; dorsal lengths of the palpal segments: P-I, $31\mu m$ ($28\mu m - 34\mu m$); P-II, $73\mu m$ ($72\mu m - 83\mu m$); P-III, $26\mu m$ ($24\mu m - 29\mu m$); P-IV, $85\mu m$ ($83\mu m$ - $94\mu m$); P-V, $29\mu m$ ($27\mu m$ - $31\mu m$); palp as shown for the female; capitulum $100\mu m$ ($93\mu m$ - $104\mu m$) in length; chelicera $159\mu m$ ($145\mu m$ -166μm) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 88 μm (93 μm -98 μm); I-Leg-5, 90 μm (93 μm -104 μm); I-Leg-6, 100 μm (104 μm); dorsal lengths of the segments of the fourth leg: W-Leg-1, $141\mu m$ ($131\mu m$ - $155\mu m$); IV-Leg-2, $121\mu m$ ($124\mu m$ - $145\mu m$); IV-Leg-3, $93\mu m$ ($90\mu m$ - $100\mu m$); IV-Leg-4, $128\mu \text{m}$ ($121\mu \text{m}-142\mu \text{m}$); IV-Leg-5, $93\mu \text{m}$ ($94\mu \text{m}-100\mu \text{m}$); IV-Leg-6, $76\mu \text{m}$ ($77\mu \text{m}-100\mu \text{m}$) $83\mu m$); figure 404 shows the proportions and chaetotaxy of the fourth leg.

Female: Dorsum as described for male, but with even a greater tendency for the color to be light; dorsal shield $460\mu m$ ($464\mu m$ - $540\mu m$) in length, $349\mu m$ $(334\mu m-395\mu m)$ in width; dorsal shield as described for male; figure 585 shows the integumental ornamentation and color pattern of one of the darker specimens; ventral shield $552\mu m$ ($562\mu m$ - $684\mu m$) in length, $334\mu m$ ($334\mu m$ - $395\mu m$) in width; anterior coxae projecting; glands of the fourth coxae placed near suture lines between third and fourth coxae; no apophyses present posteromedial to these glands; projections associated with insertions of fourth legs bluntly pointed, with several setae on and somewhat anterior to these projections; posterior suture lines of fourth coxae obliterated; genital field distinctly set off from rest of body; gonopore relatively small and oval; a medial notch present at posterior end; genital acetabula numerous, with an anterior pair tending to be double; figure 408 shows the ventral shield; dorsal lengths of the palpal segments: P-I, 28µm $(31\mu\text{m}-34\mu\text{m}); \text{ P-II}, 69\mu\text{m} (69\mu\text{m}-83\mu\text{m}); \text{ P-III}, 24\mu\text{m} (24\mu\text{m}-29\mu\text{m}); \text{ P-IV}, 80$ μm (78 μm -90 μm); P-V, 28 μm (29 μm -31 μm); figure 406 shows the proportions and chaetotaxy of the palp; capitulum $90\mu m$ ($92\mu m$ -lll μm) in length; chelicera $155\mu\mathrm{m}$ ($155\mu\mathrm{m}$ - $179\mu\mathrm{m}$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $76\mu \text{m}$ ($73\mu \text{m}$ - $83\mu \text{m}$); I-Leg-5, $78\mu \text{m}$ ($76\mu \text{m}$ - $80\mu \text{m}$); I-Leg-6, 83 μm (79 μm -89 μm); figure 402 shows these segments.

Holotype: Adult of, White Rock River (southwest of Timaru), where Cliffs

Rd branches off Pareora-Cave Rd, South Island, Nov. 18, 1982.

Allotype: Adult \mathcal{P} , same data as holotype.

Paratypes: NORTH ISLAND: 12, Waima River on Rt 12, 7 km west of Taheke, May 30, 1981; 9 o, 3 a, stream at Twin Bridges, near Nukutawhiti, May 30, 1981; 10 of, 5 9, stream at Sandy's Bridge on Rt 2, between Opotiki and Gisborne, June 3, 1981; 3 of, 2 a, stream at Opato Bridge, 67 km southeast of Opotiki, June 3, 1981; 6 of, 8 9, Mangamuka River on Rt 1 (northeast of town), approx 3 km north of forest reserve, Oct. 19, 1982; 1 \(\text{?}, \text{ Pohue Stream at Waiomu (in the Coromandel Peninsula), Oct. 26, 1982; 1 of, 12 app. Tapu River, 1 km east of Tapu (Coromandel Peninsula), Oct. 27, 1982; 1 of, 1 ♀, tributary of Waiwawa River at AA Rest Stop, 3km west of Coroglen (Coromandel Peninsula), Oct, 27, 1982; 6 of, 8 9, Boom Stream on Rt 25, between Hakaai and Whangamata, Oct. 27, 1982; 8 of, 13 9, Torere River at Torere, on Rt 35 north of Opotiki, Oct. 28, 1982; 2 of, 1 \, stream 1 km north of Tohere (east of Opotiki on Rt 35), Oct. 29, 1982; 63 ♂, 184 ♀, stream at Owhiritoa Bridge, on Rt 2 in ''Gorge'' south of Opotiki, Oct. 29, 1982; 24 of, 47 9, stream at Omaukoro Bridge, on Rt 2 in "Gorge" south of Opotiki, Oct. 29, 1982; 101 of, 196 af, stream at Opato Bridge area (at rest stop) on Rt 2 in ''Gorge'' south of Opotiki, Oct. 29, 1982; 79 of, 81 \(\pi \), from stream at Sandy's Bridge, on Rt 2 in "Gorge" south of Opotiki, Oct. 29, 1982; 35 ♂, 28 ♀, stream at Gerrards Bridge, on Rt 2 in ''Gorge'' south of Opotiki, Oct. 29, 1982; 4 of, Mangatepopo Stream on Rt 47, between National Park and Rotoaira Rd cutoff (southwest of Lake Taupo), Nov. 3, 1982; SOUTH ISLAND: 5 ♂, 45 ♀, Opouri River between Carluke and Opouri Valley on Tennyson Inlet Rd, Nov. 6, 1982; 8 of, 17 9, Graham Stream on Rt 6, at picnic grounds 8 km northeast of Whangamoa Saddle, Nov. 6, 1982; 11 ♂, 39 ♀, tributary of the Motupiko River, on Rt 6 between Korere and Glenhope, Nov. 7, 1982; 15 of, 13 9, Shag River near its headwaters, on Rt 85, 2 km west of Pigroot Summit (Central Otego), Nov. 16, 1982; 33 \circ , 71 \circ , same data as holotype; 93 \circ , 101 \circ , Rocky Gully Stream on Rt 8, between Cave and Fairlie (west of Timaru), Nov. 18, 1982; 24 of, 60 9, Oaro River at Oaro, on Rt 1 approx 20 km south of Kaikoura, Nov. 19, 1982; 12 ♂, 15 ♀, Irongate Stream on Rt 1, 24 km north of Kaikoura, Nov. 21, 1982; 29 of, 51 \, Kaituna River on Rt 6, 5 km south of Havelock, Nov. 22, 1982; 128 ♂, 180 ♀, Whangamoa River on Rt 6, approx 5 km northeast of Whangamoa Saddle, Nov. 23, 1982.

Genus EVIDATURUS, new genus

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets with one pair of glandularia; typically, glandularia 2 are completely absent, but in one individual (fig. 338), there is a small, free glandularia sclerite on one side; posteromedial plate bearing two pairs of glandularia; integument very rugose; a tripartite ridge present near posterior end of posteromedial plate; this ridge loops around the posterior glandularia and extends posteriorly near the midline (figs. 576, 577); first three pairs of coxae projecting; capitular bay a narrow V-shape; posterior margins of fourth coxae extending anteromedially; glands of the fourth coxae placed near suture lines between third and fourth coxae; projections associated with insertions of fourth legs well developed and truncate; excretory pore on a large terminal tubercle; P-II without ventral papillae; P-IV bulging ventrally; no sexual dimorphism of the legs.

Type Species: Evidaturus exilis, new species

Discussion: The loss of the "free" glandularia (or the tendency to lose it, since it is present on one side in one individual) is without doubt a derived condition. The present genus shares no major characteristics with other New Zealand Notoaturins and I am uncertain of its relationships to the other genera.

63. Evidaturus exilis, new species

(Figs. 335, 337, 338, 340, 342, 576, 577)

Male: Integumental pigmentation absent, eye pigment reduced; dorsal shield $266 \mu \text{m}$ in length, $243 \mu \text{m}$ in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; the pair of glandularia which generally lie free in the integument (glandularia 2) have disappeared; posteromedial plate with two pairs of glandularia; ornamentation of dorsal shield similar to that shown for the female (figs. 576, 577); ventral shield $410\mu m$ in length, 297 μm in width; anterior coxae projecting and bluntly pointed; capitular bay V-shaped but rounded posteriorly; glandularia of the fourth coxae located near suture lines between third and fourth coxae and well anteromedial to insertions of fourth legs; projections associated with insertions of fourth legs truncate; a pair of glandularia (epimeroglandularia 2) located posteromedial to these projections; gonopore small, oval and subterminal; a few genital acetabula present on each side; excretory pore on a large terminal tubercle; figure 337 shows the morphology of the ventral shield; dorsal lengths of the palpal segments: P-I, $15\mu m$; P-II, $43\mu m$; P-III, $22\mu m$; P-IV, $60\mu m$; P-V, $28\mu m$; structure of palp as illustrated for the female; capitulum 78µm in length; chelicera 93µm in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $62\mu m$; I-Leg-5, $70\mu m$; I-Leg-6, 64μm; dorsal lengths of the segments of the fourth leg: IV-Leg-2, 76μm; IV-Leg-3, $69\mu \text{m}$; IV-Leg-4, $72\mu \text{m}$; IV-Leg-5, $86\mu \text{m}$; IV-Leg-6, $79\mu \text{m}$; fourth leg unmodified (fig. 340).

Female: Dorsum as described for male; dorsal shield $315\mu m$ ($226\mu m$ – $338\mu m$) in length, $\overline{2}66\mu m$ ($243\mu m$ – $288\mu m$) in width; in one specimen, glandularia 2 is present on a small sclerite on one side (fig. 338); ventral shield $403\mu m$ ($380\mu m$ – $441\mu m$) in length, $282\mu m$ ($266\mu m$ – $293\mu m$) in width; except for genital field region, ventral shield as described for male; gonopore small for a female and subterminal; dorsal lengths of the palpal segments: P-I, $17\mu m$ ($15\mu m$ – $18\mu m$); P-II, $43\mu m$ ($45\mu m$ – $46\mu m$); P-III, $20\mu m$ ($19\mu m$ – $21\mu m$); P-IV, $59\mu m$ ($55\mu m$ – $56\mu m$); P-V, $29\mu m$ ($24\mu m$ – $29\mu m$); ventral side of P-IV bowed and with its ventral setae located in proximal half of segment (fig. 335); capitulum $79\mu m$ ($79\mu m$ – $85\mu m$) in length; chelicera $93\mu m$ ($90\mu m$ – $93\mu m$) in length; structure of capitulum and chelicera as illustrated for the related species (fig. 339); dorsal lengths of the distal segments of the first leg: I–Leg-4, $57\mu m$ ($50\mu m$ – $59\mu m$); I–Leg-5, $64\mu m$ ($55\mu m$ – $65\mu m$); I–Leg-6, $57\mu m$ ($48\mu m$ – $60\mu m$); structure of first leg much as shown for the related species (fig. 346); fourth leg similar to that illustrated for the

male but heavy setae on IV-Leg-3 are not as thickened.

Holotype: Adult of, from a tributary of the Whangamoa River at Collins Valley Picnic Grounds, on Rt 6 just west of Rai Saddle, South Island, Nov. 22, 1982.

Allotype: Adult 9, same area as holotype on Nov. 6, 1982.

Paratypes: SOUTH ISLAND: 2 \(\frac{1}{2} \), from a tributary of the Wakamarina River 7 km southeast of Canvastown (off Rt 6), Nov. 5, 1982; 1 \(\frac{1}{2} \), Four Mile River on Rt 6, between Charleston and Tiromoana, Nov. 8, 1982.

Discussion: See remarks under the following species for characteristics

which will separate these two known members of the genus.

64. Evidaturus scopticus, new species

(Figs. 339, 341, 343, 344, 346-348)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 258 μ m in length, 243 μ m in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; the glandularia typically lying free in the integument (glandularia 2) have disappeared completely; posteromedial plate bearing two pairs of glandularia; ornamentation of dorsal shield as shown for the related species (figs. 576, 577); ventral shield $380\mu m$ in length, $266\mu m$ in width; anterior coxae projecting far forward and relatively sharp-pointed; the capitular bay sharply V-shaped; glandularia of the fourth coxae placed very near suture line between third and fourth coxae and well anteromedial to insertions of fourth legs; projections associated with insertions of fourth legs truncate and relatively wide; a pair of glandularia (epimeroglandularia 2) placed posteromedial to these projections; gonopore very small, oval and subterminal; a few genital acetabula present on each side; excretory pore located on a moderately developed terminal tubercle; figure 348 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $15\mu m$; P-II, $42\mu m$; P-III, $19\mu m$; P-IV, $46\mu m$; P-V, $27\mu m$; structure of palp as illustrated for female; capitulum $76\mu \text{m}$ in length; chelicera $91\mu \text{m}$ in length; figure 339 shows a lateral view of the capitulum and chelicera; dorsal lengths of the distal segments of the first leg: I-Leg-4, $50\mu m$; I-Leg-5, $57\mu m$; I-Leg-6, $52\mu m$; dorsal lengths of the segments of the fourth leg: IV-Leg-2, $76\mu m$; IV-Leg-3, $65\mu m$; IV-Leg-4, $64\mu m$; IV-Leg-5, $76\mu \text{m}$; IV-Leg-6, $62\mu \text{m}$; fourth leg relatively unmodified (fig. 347).

Female: Dorsum as described for male; dorsal shield $273\mu m$ in length, $254\mu m$ in width; ventral shield $403\mu m$ in length, $273\mu m$ in width; except for genital field area, ventral shield as described for male; gonopore small for a female, oval and subterminal (fig. 344); dorsal lengths of the palpal segments: P-I, 17 μm ; P-II, $40\mu m$; P-III, $17\mu m$; P-IV, $48\mu m$; P-V, $27\mu m$; P-IV bowed ventrally; one of the ventral setae of P-IV located near middle, the second is inserted in distal half of segment; figure 341 shows the proportions and chaetotaxy of the palp; capitulum $76\mu m$ in length; chelicera $86\mu m$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $52\mu m$; I-Leg-5, $59\mu m$; I-Leg-6, $52\mu m$; figure 346 shows these segments; fourth leg similar to that of male.

Holotype: Adult of, from gravel deposits in a stream on Wainui Rd, 5 km west of Mahinepua Rd, northern North Island, Oct. 22, 1982.

Allotype: Adult ♀, same data as holotype.

Discussion: The present species is closely related to the preceding species but has longer and more sharply pointed anterior coxae and the capitular bay is a sharp V-shape (compare figures 342 and 344). Also, the ventral bulge and ventral setae of P-IV are in the proximal half of segment in *exilis* (compare figures 335 and 341). Too few specimens are presently known to make any definitive statements concerning species ranges, but presently *scopticus* is known only from the very northern portion of North Island and *exilis* has only been taken on South Island.

Genus PIOTATURUS, new genus

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets with one pair of glandularia; a pair of glandularia sclerites (glandularia 2) between medial corners of anterolateral and posterolateral platelets and lateral edges of posteromedial plate; posteromedial plate bearing two pairs of glandularia; dorsal sclerites papillate and with noticeable ridges (figs. 578, 579); anterodorsal portion of ventral shield produced into a broad hood which is moderately projecting and indented medially in one species (fig. 350), scarcely projecting and slightly pointed in another (fig. 360); intercoxal slots well developed; projections associated with insertions of fourth legs more or less rounded; a pair of glandularia located well medial or anteromedial to insertions of fourth legs; posterior end of ventral shield and genital field highly modified in the male (fig. 350), with a large posterior cavity; males with a pronounced sexual dimorphism of the fourth leg (in the one species in which that sex is known); legs exhibiting some lateral compression but IV-Leg-3 relatively unmodified and IV-Leg-2 not especially enlarged; however, second segment of anterior legs is noticeably lengthened; capitulum with an anchoral process; P-II with ventral cuticular projections; P-IV bulging ventrally.

Type Species: Piotaturus alvecaudatus, new species

Discussion: The present genus seems most closely related to *Omegaturus*. It shares with this genus the intercoxal slots (fig. 349) and a similar development of a dorsal hood (at least in the type species), both of which seem to be apomorphic for the New Zealand notoaturins. The structure of the palp in *Piotaturus* is such that a simple lengthening of the palpal segments would produce the condition found in *Omegaturus*. IV-Leg-3 of the present genus is not modified as in the related genus but one can see a tendency in this direction in the third segment of the anterior three pairs of legs. Present evidence seems to indicate *Piotaturus* belongs on the evolutionary line which culminates in *Planaturus* and *Taintaturus*.

65. Piotaturus alvecaudatus, new species

(Figs. 345, 349-355, 358, 578)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 410 μm (418 μm -449 μm) in length, 441 μm (433 μm -471 μm) in width; anteromedial plate bearing the postocularia on small tubercles; anterolateral platelets with a pair of glandularia; a pair of glandularia on small sclerites lying free in the integument; posteromedial plate with two pairs of glandularia; anterior end of ventral shield produced into a wide, medially indented hood (fig. 350); ornamentation of dorsal shield as shown for the female (fig. 578); ventral shield $703\mu\mathrm{m}$ $(692\mu m-775\mu m)$ in length, $502\mu m$ $(506\mu m-540\mu m)$ in width; anterior coxae are broad and somewhat pointed; glandularia of fourth coxae placed near the suture lines between third and fourth coxae; projections associated with insertions of fourth legs wide and rounded; posterior end of body highly modified; posterior suture lines of fourth coxae extending far anteromedially; epimeroglandularia 2 shifted well anteromedial to insertions of fourth legs; posterior end with a deep median cleft; gonopore hidden in ventral view by an anteriorly directed flap (fig. 353); many pairs of genital acetabula present; posterior end of ventral shield with an extremely large concavity; figures 349 and 350 indicate dorsal and ventral aspects of the ventral shield; excretory pore dorsal, slightly posterior to

posterior end of ventral shield; dorsal lengths of the palpal segments: P-I, 36 μ m (35 μ m-36 μ m); P-II, 86 μ m (86 μ m-88 μ m); P-III, 41 μ m (40 μ m-43 μ m); P-IV, 87 μ m (86 μ m-93 μ m); P-V, 62 μ m (61 μ m-62 μ m); structure of palp as shown for the female; capitulum 152 μ m (145 μ m-154 μ m) in length; chelicera 131 μ m (121 μ m-142 μ m) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 72 μ m (70 μ m-76 μ m); I-Leg-5, 96 μ m (92 μ m-97 μ m); I-Leg-6, 92 μ m (87 μ m-93 μ m); dorsal lengths of the segments of the fourth leg: IV-Leg-1, 111 μ m (111 μ m-118 μ m); IV-Leg-2, 155 μ m (141 μ m-162 μ m); IV-Leg-3, 118 μ m (113 μ m-133 μ m); IV-Leg-4, 192 μ m (178 μ m-207 μ m); IV-Leg-5 (to tip of distal projection) 296 μ m (266 μ m-311 μ m); IV-Leg-6, 152 μ m (155 μ m-177 μ m); greatest height of IV-Leg-5, 125 μ m; sexual dimorphism of fourth leg better illustrated (fig. 354) than described.

Female: Dorsum as described for male; dorsal shield $510\mu m$ ($532\mu m-577$ μ m) in length, 460μ m (464μ m- 516μ m) in width; dorsal shield proportionally longer, otherwise as described for male; figure 578 shows the ornamentation of the dorsal shield; ventral shield $668\mu m$ ($684\mu m$ - $744\mu m$) in length, $517\mu m$ $(517\mu \text{m}-547\mu \text{m})$ in width; anterior coxae somewhat projecting; glandularia of the fourth coxae placed near suture lines between third and fourth coxae; median margins of fourth coxae reduced nearly to median angles; projections associated with insertions of fourth legs wide and relatively rounded; genital field region distinctly set off from remainder of body; gonopore subterminal and very large; several genital acetabula on each side; figure 358 shows the structure of the ventral shield; excretory pore dorsal in position; dorsal lengths of the palpal segments: P-I, $34\mu m$ ($34\mu m$ - $35\mu m$); P-II, $83\mu m$ ($81\mu m$ - $86\mu m$); P-III, $41\mu m$ $(40\mu \text{m}-42\mu \text{m})$; P-IV, $83\mu \text{m}$ $(86\mu \text{m}-90\mu \text{m})$; P-V, $62\mu \text{m}$ $(59\mu \text{m}-61\mu \text{m})$; ventral side of P-II with several small sharp-pointed cuticular projections; figure 351 illustrates the structure of the palp; capitulum $145 \mu m$ ($142 \mu m$ - $162 \mu m$) in length; chelicera $135\mu m$ ($128\mu m$ - $135\mu m$) in length; figure 355 shows the proportions of the capitulum and chelicera; dorsal lengths of the distal segments of the first leg: I-Leg-4, $69\mu m$ ($64\mu m$ - $69\mu m$); I-Leg-5, $83\mu m$ ($83\mu m$ - $86\mu m$); I-Leg-6, 79 μm (79 μm -83 μm); figure 352 shows these segments; dorsal lengths of the distal segments of the fourth leg: W-Leg-4, $128\mu m$ ($126\mu m-144\mu m$); W-Leg-5, $133\mu m$ $(129\mu \text{m}-148\mu \text{m})$; IV-Leg-6, $103\mu \text{m}$ $(100\mu \text{m}-111\mu \text{m})$; greatest height of IV-Leg-4, $81\mu m$ (67 μm -73 μm); distal segments of fourth leg relatively high and somewhat laterally compressed.

Holotype: Adult of, from a tributary of the Motupiko River on Rt 6, between Korere and Glenhope, South Island, Nov. 25, 1982.

Allotype: Adult 9, same data as holotype.

Paratypes: NORTH ISLAND: 1 \(\frac{1}{2} \), stream at Sandy's Bridge on Rt 2, in the "Gorge" south of Opotiki, June 3, 1981; 1 \(\frac{1}{2} \), tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), Oct. 27, 1982; 1 \(\frac{1}{2} \), stream at Owhiritoa Bridge, on Rt 2 in "Gorge" south of Opotiki, Oct. 29, 1982; 1 \(\frac{1}{2} \), stream at Sandy's Bridge, on Rt 2 in "Gorge" south of Opotiki, Oct. 29, 1982; SOUTH ISLAND: 1 \(\frac{1}{2} \), Opouri River between Carluke and Opouri Valley on Tennyson Inlet Rd, Nov. 6, 1982; 2 \(\frac{1}{2} \), tributary of the Motupiko River, on Rt 6, between Korere and Glenhope, Nov. 7, 1982; 3 \(\frac{1}{2} \), Graham Stream on Rt 6, at picnic grounds 8 km northeast of Whangamoa Saddle, Nov. 23, 1982; 3 \(\frac{1}{2} \), same data as holotype.

Discussion: The sexual dimorphism of the male body and fourth leg is unique. See remarks under the following species for characters separating the females of these two species of *Piotaturus*.

66. Piotaturus bovalus, new species

(Figs. 356, 357, 359-361, 579)

Female: Both integumental and eye pigment absent; dorsal shield 456µm $(452\mu m-471\mu m)$ in length, $372\mu m$ $(365\mu m-380\mu m)$ in width; anterodorsal plate bearing the postocularia on small tubercles; anterolateral platelets with one pair of glandularia; a pair of glandularia on small sclerites lying free in the integument; posteromedial plate with two pairs of glandularia; no pronounced development of a hood on anterior end of ventral shield as in the related species; the ridges on dorsal shield indicated in figure 360 and also in figure 579, the latter also showing surface ornamentation; ventral shield $577\mu m$ ($577\mu m-612\mu m$) in length, $388\mu m$ ($395\mu m-422\mu m$) in width; anterior coxae broad and roundly pointed; glandularia of the fourth coxae located near suture lines between third and fourth coxae; projections associated with insertions of fourth legs wide and are rounded; genital field not distinctly set off from remainder of ventral shield; gonopore ventral; several genital acetabula present on each side; excretory pore located on a well developed terminal tubercle (fig. 361); dorsal lengths of the palpal segments: P-I, $28\mu m$ ($27\mu m-31\mu m$); P-II, $66\mu m$ ($64\mu m-66\mu m$); P-III, $31\mu \text{m} (31\mu \text{m} - 32\mu \text{m}); \text{ P-IV}, 81\mu \text{m} (79\mu \text{m} - 85\mu \text{m}); \text{ P-V}, 41\mu \text{m} (39\mu \text{m} - 41\mu \text{m}); \text{ ven-}$ tral side of P-II with well developed spine-like cuticular projections (fig. 359); capitulum $131\mu \text{m}$ ($128\mu \text{m}$ – $135\mu \text{m}$) in length; chelicera $121\mu \text{m}$ ($114\mu \text{m}$ – $121\mu \text{m}$) in length; structure of capitulum and chelicera similar to that shown for the related species (fig. 355); dorsal lengths of the distal segments of the first leg: I-Leg-4, $55\mu m$ ($52\mu m$ - $55\mu m$); I-Leg-5, $66\mu m$ ($66\mu m$ - $68\mu m$); I-Leg-6, $67\mu m$ $(64\mu \text{m}-69\mu \text{m})$; figure 357 illustrates these segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, $93\mu m$ ($85\mu m$ - $91\mu m$); IV-Leg-5, $96\mu m$ $(89\mu \text{m} - 96\mu \text{m})$; IV-Leg-6, $81\mu \text{m}$ ($81\mu \text{m} - 89\mu \text{m}$); greatest height of IV-Leg-4, 41 μm (44 μm); these segments expanded (fig. 356) but not as much as in the previous species.

Male: Unknown.

Holotype: Adult \(\partial \), Irongate Stream on Rt 1, 24 km north of Kaikoura, South Island, Nov. 21, 1982.

Paratypes: 6 \(\rangle \), same data as holotype.

Discussion: Unfortunately, the male of the present species is unknown but it is expected that it will show some degree of sexual dimorphism of the body and legs. Females of the present species differ from females of alvecaudatus in the ventral position of the gonopore, indistinct separation of the genital field region from rest of body and terminal position of excretory pore. The cuticular projections on the ventral side of P-II are also much longer in the present species.

Genus PARATRYSSATURUS Imamura

Paratryssaturus Imamura, 1979. Jour. Speleol. Soc. Japan, 4: 27.

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets with one pair of glandularia; a pair of glandularia (glandularia 2) located on small sclerites placed between medial corners of anterolateral and posterolateral platelets and lateral edges of posteromedian plate; posteromedian plate with two pairs of glandularia; glandularia not on tubercles; anterodorsal portion of the ventral shield with a long, somewhat pointed medial projection which extends

nearly as far forward as dorsal portion of camerostome (fig. 412); anterior three pairs of coxae projecting; coxae confined to anterior half of body; posterior margins of fourth coxae extending at right angles to long axis of body; glands of the fourth coxae placed near suture lines between third and fourth coxae; coxal slots absent; projections associated with insertions of fourth legs truncate and not bearing setae; genital field may be somewhat set off from remainder of ventral shield but no cauda present; gonopore ventral and well forward in both sexes; ventral papillae located on P-II, P-IV somewhat flattened ventrally and widened in a lateral to medial direction; IV-Leg-6 ending in a somewhat thickened seta on medial surface; males with a characteristic sexual dimorphism of the fourth leg in which IV-Leg-5 is expanded distally and bears three thickened setae; IV-Leg-4 also bears three thickened setae.

Type Species: Paratryssaturus minutus (Hopkins).

KEY TO THE NEW ZEALAND SPECIES OF PARATRYSSATURUS

2. Genital field area tending to be distinctly set off from remainder of ventral shield (figs. 409, 410); posteromedial plate and posterolateral platelets noticeably darker than the others; IV-Leg-5 of male expanding abruptly in distal half of segment (fig. 407)

Paratryssaturus cantermus, new species(p. 91)
Genital field area tending to be indistinctly set off from remainder
of ventral shield (figs. 414, 416); integumental pigment completely
absent; IV-Leg-5 of male gradually expanding, beginning in proximal half of segment (fig. 411)

Paratryssaturus minutus (Hopkins) (p. 93)

67. Paratryssaturus cantermus, new species

(Figs. 405, 407, 409, 410, 412, 413, 590)

Male: Integumental pigmentation present (posteromedial plate and posterolateral platelets darker) and eye pigment well developed; dorsal shield 327µm $319\mu \text{m}-342\mu \text{m}$) in length, $243\mu \text{m}$ ($212\mu \text{m}-247\mu \text{m}$) in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; a pair of glandularia on small sclerites lying free in the integument; posteromedial plate with two pairs of glandularia; ornamentation of dorsal shield consisting of papillae joined into a reticulate background (fig. 590); ventral shield $440\mu m$ ($440\mu m$ - $456\mu m$) in length, $251\mu m$ ($232\mu m$ - $258\mu m$) in width; anterior coxae projecting; glands of the fourth coxae placed near suture lines between third and fourth coxae; projections associated with insertions of fourth legs relatively wide and truncate; posterior suture lines of fourth coxae evident; genital field distinctly set off from rest of body; gonopore very small and ventral in position; several genital acetabula on each side near posterior end of ventral shield; excretory pore subterminal; figure 410 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $17\mu m$ ($15\mu m$ - $17\mu m$); P-II, $38\mu m$ (36) μ m-39 μ m); P-III, 17 μ m (17 μ m-18 μ m); P-IV, 45 μ m (44 μ m-46 μ m); P-V, 24 μ m

 $(21\mu\text{m}-24\mu\text{m})$; palp as shown for the female; capitulum $83\mu\text{m}$ ($73\mu\text{m}-83\mu\text{m}$) in length, chelicera $110\mu\text{m}$ ($104\mu\text{m}-114\mu\text{m}$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $52\mu\text{m}$ ($50\mu\text{m}-52\mu\text{m}$); I-Leg-5, $54\mu\text{m}$ ($50\mu\text{m}-56\mu\text{m}$); I-Leg-6, $58\mu\text{m}$ ($58\mu\text{m}-65\mu\text{m}$); dorsal lengths of the segments of the fourth leg (measurements to distal end of distal projection on IV-Leg-2): IV-Leg-1, $58\mu\text{m}$ ($55\mu\text{m}-57\mu\text{m}$); IV-Leg-2, $83\mu\text{m}$ ($81\mu\text{m}-83\mu\text{m}$); IV-Leg-3, $52\mu\text{m}$ ($52\mu\text{m}-55\mu\text{m}$); IV-Leg-4, $64\mu\text{m}$ ($62\mu\text{m}-66\mu\text{m}$); IV-Leg-5, $63\mu\text{m}$ ($65\mu\text{m}-66\mu\text{m}$); IV-Leg-6, $48\mu\text{m}$ ($48\mu\text{m}-50\mu\text{m}$); projection of IV-Leg-2 sharp-pointed and projecting far beyond insertion of IV-Leg-3; proximal portion of IV-Leg-5 narrow for quite a distance before abruptly expanding (fig. 407).

Female: Morphology, color and ornamentation of dorsal shield as described for male; dorsal shield $319\mu m$ ($315\mu m-349\mu m$) in length, $243\mu m$ ($232\mu m-273\mu m$) in width; figure 590 shows the ornamentation of the dorsal shield; ventral shield $421\mu m$ ($418\mu m-479\mu m$) in length, $258\mu m$ ($243\mu m-277\mu m$) in width; female ventral shield proportionally wider but, except for genital field region, similar to that described for male; gonopore relatively small and located well anterior to posterior end; several pairs of acetabula near posterior end of genital field; excretory pore subterminal (fig. 409); dorsal lengths of the palpal segments: P-I, $16\mu m$ ($15\mu m-18\mu m$); P-II, $38\mu m$ ($37\mu m-41\mu m$); P-III, $16\mu m$ ($16\mu m-17\mu m$); P-IV, $45\mu m$ ($43\mu m-46\mu m$); P-V, $20\mu m$ ($20\mu m-21\mu m$); figure 405 shows the proportions and chaetotaxy of the palp; capitulum $83\mu m$ ($83\mu m-88\mu m$) in length; chelicera $112\mu m$ ($110\mu-114\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $45\mu m$ ($44\mu m-50\mu m$); I-Leg-5, $52\mu m$ ($48\mu m-49\mu m$); I-Leg-6, $55\mu m$ ($52\mu m-58\mu m$); figure 413 illustrates these segments; IV-Leg-2 with a projection which extends well beyond insertion of IV-Leg-3.

Holotype: Adult of, from a tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglaen (Coromandel Peninsula), North Island, Oct. 27, 1982.

Allotype: Adult ♀, same data as holotype.

Paratypes: NORTH ISLAND: 12, stream on Wainui Rd, 5 km west of Mahinepua Rd, Oct. 22, 1982; 3 ♂, 4 ♀, same data as holotype; 1 ♂, 1 ♀, Mangamawhete Stream on Rt 3, between Inglewood and Stratford (Egmont area), Nov. 1, 1982; 1 of, Mangatokiiti Stream on Opunake Rd, 10 km west of Stratford (Egmont area), Nov. 1, 1982; 3 ♂, 3 ♀, headwaters of Whangamata Stream, 10 km northwest of Taupo, Nov. 3, 1982; 1 \, Otupoto Stream on Rt 32, west of Lake Taupo, Nov. 3, 1982; SOUTH ISLAND: 2 of, tributary of Wakamarina River 7 km southeast of Canvastown (off Rt 6), Nov. 5, 1982; 2 of, 1 \, Opouri River between Carluke and Opouri Valley on Tennyson Inlet Rd, Nov. 6, 1982; 12, tributary of Whangamoa River slightly west of Rai Saddle (at Collins Valley Picnic Grounds), Nov. 6, 1982; 2 \, Little Hope River on Rt 6, at bridge slightly southwest of the Hope Saddle (near Glenhope), Nov. 7, 1982; 4 ♂, 7 ♀, Four Mile River on Rt 6, between Charleston and Tiromoana, Nov. 8, 1982; 2 of, 1 9, Adamson Creek on Rt 6, between Lake Ianthe and Wanganui, Nov. 9, 1982; 12, Cole Creek on Rt 6, between Lake Moeraki and Haast, Nov. 10, 1982; 2 of, 11 9, Shag River near its headwaters, on Rt 85, 2 km west of Pigroot Summit, Nov. 16, 1982; 5 of, 3 9, small creek on Rt 6, approx 10 km west of Havelock (northern North Island), Nov. 22, 1982; 2 of, 1 \, tributary of Whangamoa River on Rt 6, just west of Rai Saddle (at Collins Valley Picnic Grounds), Nov. 22, 1982; 2 of, 1 approximately, Whangamoa River on Rt 6, approx 5 km northeast of Whangamoa Saddle, Nov. 23, 1982; 3 \(\frac{1}{2}, \) tributary of Waitapu River at Paynes Ford, 3 km south of Takaka, Nov. 24, 1982; 2 of, 1 \, Pariwhakaoho River on Rt 60, 14 km northwest of Takaka, Nov. 24, 1982.

Discussion: The combination of pigmented posteromedial plate and postero-

lateral platelets, plus the subterminal position of the excretory pore and pronounced projection on IV-Leg-2, will separate both sexes of the present species from other members of the genus. The male fourth leg, with IV-Leg-5 narrow in much of the proximal portion and then abruptly widening, is also diagnostic.

68. Paratryssaturus minutus (Hopkins)

(Figs. 411, 414-418, 588)

Tryssaturus minutus Hopkins, 1969. Trans. Royal Soc. New Zealand, 11: 92. Tryssaturus (Paratryssaturus) minutus Imamura, 1979. Jour. Speleol. Soc. Japan, 4: 28.

Male: Integumental pigment absent, eye pigment only slightly reduced; dorsal shield $384\mu\text{m}-429\mu\text{m}$ in length, $228\mu\text{m}-258\mu\text{m}$ in width; anteromedial plate bearing the postocularia; anterolateral platelets with one pair of glandularia; one pair of glandularia on small sclerites lying free in the integument; posteromedial plate with two pairs of glandularia; ornamentation of dorsal shield consisting of papillae joined into a reticulate pattern as shown for the female (fig. 588); ventral shield $384\mu\mathrm{m}$ - $430\mu\mathrm{m}$ in length, $228\mu\mathrm{m}$ - $258\mu\mathrm{m}$ in width; anterior coxae projecting; glands of the fourth coxae placed near suture lines between third and fourth coxae; projections associated with insertions of fourth legs relatively wide and truncate; posterior suture lines of fourth coxae evident; genital field indistinctly set off from remainder of body; gonopore very small and ventral in position; several genital acetabula on each side near posterior end of genital field; excretory pore terminal; figure 414 shows the ventral shield; dorsal lengths of the palpal segments: P-I, 13μ m- 14μ m; P-II, 34μ m- 36μ m; P-III, 15μ m- 17μ m; P-IV, $38\mu\text{m}$ - $45\mu\text{m}$; P-V, $19\mu\text{m}$ - $21\mu\text{m}$; palp as shown for female; capitulum 72 μm -76 μm in length; chelicera 93 μm -104 μm in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $43\mu m$ -52 μm ; I-Leg-5, $45\mu m$ -52 μm ; I-Leg-6, $52\mu\text{m}$ - $55\mu\text{m}$; dorsal lengths of the segments of the fourth leg: IV-Leg-1 $45\mu\text{m}-55\mu\text{m}$; W-Leg-2, $59\mu\text{m}-69\mu\text{m}$; W-Leg-3, $40\mu\text{m}-48\mu\text{m}$; W-Leg-4, $59\mu\text{m} 65\mu \text{m}$; IV-Leg-5, $66\mu \text{m}$ - $76\mu \text{m}$; IV-Leg-6, $48\mu \text{m}$ - $55\mu \text{m}$; projection on IV-Leg-2 rather short and truncate; IV-Leg-5 gradually expanding along most of length; height of this segment approximately one-half its length (fig. 411).

Female: Dorsum as described for male; dorsal shield $304\mu\text{m}$ – $334\mu\text{m}$ in length, $243\mu\text{m}$ – $258\mu\text{m}$ in width; figure 588 shows the ornamentation of the dorsal shield; ventral shield $395\mu\text{m}$ – $440\mu\text{m}$ in length, $228\mu\text{m}$ – $258\mu\text{m}$ in width; female ventral shield similar to that of male except female gonopore is larger (fig. 416); dorsal lengths of the palpal segments: P-I, $15\mu\text{m}$ – $17\mu\text{m}$; P-II, $36\mu\text{m}$ – $42\mu\text{m}$; P-III, $14\mu\text{m}$ – $19\mu\text{m}$; P-IV, $41\mu\text{m}$ – $50\mu\text{m}$; P-V, $21\mu\text{m}$ – $27\mu\text{m}$; figure 415 shows the proportions and chaetotaxy of the palp; capitulum $79\mu\text{m}$ – $86\mu\text{m}$ in length; chelicera $104\mu\text{m}$ – $111\mu\text{m}$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $44\mu\text{m}$ – $50\mu\text{m}$; I-Leg-5, $48\mu\text{m}$ – $55\mu\text{m}$; I-Leg-6, $52\mu\text{m}$ – $64\mu\text{m}$; figure 417

shows these segments; IV-Leg-2 with a short projection as in male.

Material Examined: NORTH ISLAND: 1 of, Stream at Opato Bridge on Rt 2, in the "Gorge" south of Opotiki, June 3, 1981; 1 of, 3 \(\varphi\), Te Whaiau Stream at the junction of Rt 47 and Rotoaria Rd, June 5, 1981; 4of, 1 \(\varphi\), stream at Opato Bridge area, at rest stop on Rt 2 south of Opotiki, Oct. 29, 1982; 1 of, 1 \(\varphi\), stream at Sandy's Bridge on Rt 2, in "Gorge" south of Opotiki, Oct. 29, 1982; SOUTH ISLAND: 6 of, 3 \(\varphi\), tributary of Wakamarina River, 7 km southeast of Canvastown (off Rt 6), Nov. 5, 1982; 1 \(\varphi\), Adamson Creek on Rt 6, between Lake Ianthe and

Wanganui, Nov. 9, 1982; $2 \, \circ'$, $1 \, \circ$, Potters Creek on Rt 6, between Bruce Bay and Lake Paringa (north of Haast), Nov. 10, 1982; $1 \, \circ$, Cole Creek on Rt 6, between Lake Moeraki and Haast, Nov. 10, 1982; $1 \, \circ$, Dunton Creek on Rt 94, 85 km south of Milford Sound, Nov. 14, 1982; $1 \, \circ'$, $2 \, \circ$, Oaro River at Oaro, on Rt 1, approx 20 km south of Kaikoura, Nov. 19, 1982; $1 \, \circ'$, Mororimu Stream on Rt 1, approx 35 km north of Kaikoura, Nov. 21, 1982; $3 \, \circ'$, $1 \, \circ$, Kaituna River on Rt 6, 5 km south of Havelock, Nov. 22, 1982; $1 \, \circ'$, $2 \, \circ$, Graham Stream on Rt 6 at picnic grounds, 8 km northeast of Whangamoa Saddle, Nov. 23, 1982; $2 \, \circ'$, from a tributary of Waitapu River at Paynes Ford, 3 km south of Takaka, Nov. 24, 1982; $4 \, \circ'$, $10 \, \circ$, Parawhakaoho River on Rt 60, 14 km northwest of Takaka, Nov. 24, 1982.

Discussion: The combination of lack of integumental pigmentation, terminal excretory pore and characteristic dorsal ornamentation (fig. 588) is diagnostic for the present species. Imamura (1979) described a related species, *P. morimotoi*, from a cave stream near Nelson, South Island, stating it differed from parvus in having postocularia on the anteromedial plate and a more slender palp with projections on the ventral side of P-II. However, all notoaturins have the postocularia on the anteromedial plate and, depending on how the palp is rotated, the palp will appear thin or thick and the projections on the ventral side of P-II more or less obvious. Types of these two species should be checked for additional characters to separate them.

69. Paratryssaturus zodelus, new species

(Figs. 419-421, 424, 426, 589)

Male: Integumental pigment absent; dorsal shield $312\mu m$ in length, $243\mu m$ in width; anteromedial plate bearing the postocularia; anterolateral platelets with a pair of glandularia; one pair of glandularia on small sclerites lying free in the integument; posteromedial plate with two pairs of glandularia; ornamentation of the dorsal shield consisting of a reticulate pattern but lacking the characteristic papillae found in the other two species (fig. 589); ventral shield $410\mu m$ in length, $254\mu m$ in width; anterior coxae projecting; glands of the fourth coxae located near suture lines between third and fourth coxae; projections associated with the insertions of fourth legs relatively wide and truncate; posterior suture lines of fourth coxae evident; genital field indistinctly set off from remainder of body; gonopore very small and ventral in position; many acetabula present; excretory pore terminal; figure 419 shows the morphology of the ventral shield; dorsal lengths of the palpal segments: P-I, $16\mu m$; P-II, $38\mu m$; P-III, $19\mu m$; P-IV, 48 μ m; P-V, 24μ m; capitulum 72μ m in length; chelicera 104μ m in length; figure 424 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $52\mu m$; I-Leg-5, $54\mu m$; I-Leg-6, $65\mu m$; figure 420 shows these segments; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $48\mu m$; IV-Leg-2, $62\mu m$; IV-Leg-3, $45\mu m$; IV-Leg-4, 69 μ m; IV-Leg-5, 72 μ m; IV-Leg-6, 69 μ m; projection on IV-Leg-2 short and very broad; IV-Leg-5 gradually expanding along most of length; length of this segment nearly three times its height (fig. 426).

Female: Not known with certainty, but two females taken from sand and gravel deposits in Staircase Creek where it flows into Lake Wakatipu (on Rt 6, southeast of Queenstown), South Island have the same surface ornamentation on the dorsal shield as is found in the male specimen from North Island. Until the male and female are taken in the same collection, the assignment of these two

females is tentative and they are not described here.

Holotype: Adult of, from Te Whaiau Stream at junction of Rt 47 and Rotoaria Rd, North Island, June 5, 1981.

<u>Discussion:</u> The present species differs from the previous two species in its characteristic dorsal shield ornamentation (compare figure 589 with figures 588 and 590). Also the male IV-Leg-5 is the least expanded in *zodelus*.

Genus KRITATURUS, new genus

Diagnosis: Characters of the New Zealand Notoaturinae; anterolateral platelets bearing two pairs of glandularia; posteromedial plate with two pairs of glandularia; dorsal sclerites either smooth or with only a slight tendency to form reticulations or ridges, especially on the lateral platelets; first coxae narrow and projecting well beyond body proper; posterior suture lines of fourth coxae, if not obliterated, extending more or less at right angles to long axis of body; the glands of the fourth coxae located near suture lines between third and fourth coxae; projections associated with insertions of fourth legs well developed; coxal slots not developed; legs not laterally compressed; small ventral papillae may or may not be present on P-II; IV-Leg-l not lengthened; male with or without a cauda; males of those species with a cauda also exhibiting a sexual dimorphism of the fourth leg.

Type Species: Kritaturus gennadus, new species.

Discussion: This genus seems very distantly related to the other New Zealand notoaturins and, with the exception of the evolutionary line with a well developed cauda (and extreme modification of the posteromedial plate), exhibiting few distinctive characteristics. Since we do not yet know what the ancestral notoaturin was like, it is impossible to be sure, but it seems likely that most of the characteristics used to define the genus will prove to be plesiomorphic. The one exception will likely be the fusion of glandularia 2 with the anteromedial platelets. A similar situation (two pairs of glandularia on the anterolateral platelets) is also found in *Planaturus*, but this is certainly a case of convergence.

The group of species in which the male exhibits a strong sexual dimorphism of the body and fourth legs is so distinctive that I was tempted to place it in a separate genus. However, females do not show characteristics which will allow them to be divided into separate genera. The two groups are, however, here split into subgenera based on presence or absence of sexual dimorphism.

Subgenus KRITATURUS: Includes those species in which a sexual dimorphism

of the male body and legs is very slight or absent.

Subgenus CAUDATURUS, new subgenus: Includes those species in which the males possess a cauda, a pronounced modification of the posteromedial plate of the dorsal shield and the male fourth leg is modified.

Type Species: Kritaturus (Caudaturus) tenonus, new species.

KEY TO THE NEW ZEALAND SPECIES OF KRITATURUS

Of the nine species assigned to this genus, two are known only from the female and one only from the male. Also males of species exhibiting a strong sexual dimorphism of the body (subgenus *Caudaturus*) are best keyed out using these characteristics. For these reasons, separate keys are provided for the two sexes.

MALES

1.	Body with a well developed cauda and a highly modified postero- medial plate (figs. 425, 433, 442, 452) Subgenus <u>Caudaturus</u> 2 Body without a well developed cauda and the posteromedial plate of the dorsal shield unmodified Subgenus <u>Kritaturus</u> 5
2.	Palp uncate (fig. 453); IV-Leg-3 extending well beyond insertion of IV-Leg-4 and bearing a large, somewhat bifurcate seta (fig. 445) Kritaturus uncipalpis, new species (p. 101) Palp not uncate; IV-Leg-3 extending slightly if at all beyond insertion of IV-Leg-4
3.	Posterior end of cauda produced into an upturned projection which is best seen in lateral view (figs. 432, 440); paired concavities of posteromedial plate only slightly anterior to this projection; associated setae of the posterior glandularia of anterolateral platelets strongly curved (figs. 433, 442)
4.	Cauda relatively wide (figs. 441, 442); setae of IV-Leg-3 greatly lengthened and thickened (fig. 444) Kritaturus tenonus, new species (p. 99) Cauda much narrower (figs. 433, 434); setae of IV-Leg-3 only slightly lengthened and thickened (fig. 437) Kritaturus rucabus, new species (p. 100)
5.	Tips of first coxae broad; gonopore long and narrow (fig. 457); P-IV relatively wide and flattened ventrally, the medial edge appearing as a ridge in medial view (fig. 461); IV-Leg-1 through 4 with long dorsal setae (fig. 459) Kritaturus sornus, new species(p. 102) Tips of first coxae more or less pointed; gonopore only slightly longer than wide; palp not flattened ventrally and without a medial ridge (fig. 472); none of the segments of the fourth leg with long dorsal setae
6.	Gonopore more or less triangular, with rows of setae both anterior and lateral to the gonopore (fig. 480); posterior suture lines of fourth coxae absent Kritaturus dornarus, new species(p. 105) Gonopore oval, with a few setae anterolateral to opening (fig. 469); posterior suture lines of fourth coxae evident Kritaturus gennadus, new species(p. 104) FEMALES
1.	Palp uncate, P-II with a ventral protubrance (fig. 453) Kritaturus uncipalpis, new species . (p. 101) Palp not uncate, without a ventral protuberance on P-II

2.	First coxae extending far forward and rounded at tips (figs. 436, 463); ventral side of P-IV somewhat flattened, with edge appearing as a ridge in medial view (figs. 438, 462); the two ventral setae of P-IV relatively far apart in a lateral to medial direction 3 Tips of first coxae relatively sharp-pointed (figs. 467, 476, 481); ventral side of P-IV not flattened, edges not appearing as a ridge in medial view; the two ventral setae of P-IV relatively close together in a lateral to medial direction
3.	Anterolateral platelets without ornamentation (figs. 591, 592) 4
	Anterolateral platelets exhibiting a somewhat reticulate orna- mentation (figs. 593, 596)
4.	Posteromedial plate of dorsal shield slightly longer than antero-
	medial plate (fig. 428) Kritaturus jacundus, new species (p. 97) Posteromedial plate noticeably shorter than anteromedial plate
	(fig. 435) Kritaturus tenonus, new species (p. 99)
5.	Anteromedial plate of dorsal shield approximately same length as posteromedial plate (fig. 448); color of dorsum light and rela-
	tively uniform Kritaturus rucabus, new species (p. 100) Anteromedial plate of dorsal shield much shorter than postero-
	medial plate; anteromedial plate and anterolateral platelets a
	deep purple color, with other sclerites light (fig. 465) Kritaturus ianthus, new species(p. 103)
	TITICAL ALITERIA DE LA SPECIE DE LA COMPANIONE
6.	Genital field distinctly set off from remainder of ventral shield; tips of first coxae sharp-pointed (fig. 467)
	Kritaturus gennadus, new species (p. 104)
	Genital field not distinctly set off from remainder of ventral shield; tips of first coxae not as pointed (figs. 476, 481)
_	
17.	P-IV relatively short (fig. 479); integumental pigmentation is a reddish purple over entire dorsum
	P-IV relatively long (fig. 475); integumental pigmentation con-
	sisting of a small purplish area on anteromedial plate and the
	remainder of dorsal shield is colorless Kritaturus dornarus, new species (p. 105)

70. Kritaturus (Caudaturus) jacundus, new species

(Figs. 422, 423, 425, 427-431, 591, 606)

Male: Integumental and eye pigment well developed; dorsal shield $243\mu m$ ($228\mu m$ - $243\mu m$) in width; anteromedial plate large and bearing the postocularia; anterolateral platelets with two pairs of glandularia, the associated setae very long; posteromedial platelets reduced to small triangular sclerites; posteromedial plate highly modified, with the two pairs of glandularia difficult to see; an abruptly angled concavity present in anterior portion of posteromedial plate (indicated by stippled area in figure 425); a pair of large flap-like lobes extending posteromedially from edges of concavity, these best seen in lateral view

(fig. 431); central area posterior to concavity raised into a hump; other modifications of dorsal shield better illustrated (fig. 425) than described; ventral shield $380\mu \text{m}$ ($334\mu \text{m}$ – $365\mu \text{m}$) in length, $258\mu \text{m}$ ($236\mu \text{m}$ – $258\mu \text{m}$) in width; first coxae projecting; glands of the fourth coxae placed near suture lines between the third and fourth coxae; projections associated with insertions of fourth legs more or less rounded and directed posterolaterally; posterior end of ventral shield forming a well developed cauda bearing the genital field; gonopore somewhat triangular, much longer than wide and flanked anteriorly by an isolated pair of acetabula; a hyaline flap partially covering anterior portion of gonopore; a row of setae on each side anterior to gonopore; many acetabula present; lateral patches of setae present at base of cauda (figs. 423, 431); dorsal lengths of the palpal segments: P-I, $20\mu \text{m}$ ($17\mu \text{m}$ - $18\mu \text{m}$); P-II, $48\mu \text{m}$ ($43\mu \text{m}$ - $45\mu \text{m}$); P-III, $22\mu \text{m}$ $(20\mu \text{m}-22\mu \text{m}); \text{ P-IV}, 58\mu \text{m} (52\mu \text{m}-55\mu \text{m}); \text{ P-V}, 25\mu \text{m} (21\mu \text{m}-24\mu \text{m}); \text{ structure}$ of palp similar to that of female; capitulum $86\mu m$ ($83\mu m$ - $86\mu m$) in length; chelicera $90\mu \text{m}$ ($93\mu \text{m}$ - $96\mu \text{m}$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $62\mu m$ ($55\mu m$ - $59\mu m$); I-Leg-5, $66\mu m$ ($62\mu m$ - $64\mu m$); I-Leg-6, $76\mu m$ ($69\mu m$ - $74\mu m$); dorsal lengths of the segments of the fourth leg: IV-Leg-1, $60\mu \text{m}$ ($58\mu \text{m}$ - $65\mu \text{m}$); IV-Leg-2, $62\mu \text{m}$ ($55\mu \text{m}$ - $62\mu \text{m}$); IV-Leg-3, $67\mu \text{m}$ (60 μ m-65 μ m); IV-Leg-4, 105 μ m (93 μ m-104 μ m); IV-Leg-5, 114 μ m (104 μ m-107 μ m); IV-Leg-6, $104\mu m$ ($97\mu m$ - $101\mu m$); some of the setae on IV-Leg-2, 3 and 4 modified, IV-Leg-4 slightly concave; structure of fourth leg better illustrated (fig. 430) than described.

Female: Integumental pigment and eye pigment developed; dorsal shield $342\mu m$ ($346\mu m$ - $357\mu m$) in length, $262\mu m$ ($266\mu m$ - $282\mu m$) in width; anteromedial plate approximately same length as posteromedial plate; dorsal sclerites without much ornamentation, although posterolateral platelets typically with longitudinal lines (fig. 591); ventral shield $365\mu m$ ($372\mu m$ - $380\mu m$) in length, $289\mu \text{m}$ ($304\mu \text{m}$ - $312\mu \text{m}$) in width; first coxae projecting well forward; glands of the fourth coxae near suture lines between third and fourth coxae; projections associated with insertions of fourth legs more or less rounded and directed posterolaterally; lateral ridges present in posterior portion of ventral shield (fig. 429); gonopore more or less terminal and flanked by many acetabula; dorsal lengths of the palpal segments: P-I, $20\mu m$ ($19\mu m$ - $21\mu m$); P-II, $52\mu m$ ($49\mu m$ - $51\mu \text{m}$); P-III, $21\mu \text{m}$ ($22\mu \text{m}$ - $23\mu \text{m}$); P-IV, $59\mu \text{m}$ ($56\mu \text{m}$ - $59\mu \text{m}$); P-V, $25\mu \text{m}$ (26) μ m-27 μ m); ventral side of P-IV flattened, the medial edge of this flattened area appearing as a ridge in medial view (fig. 427); capitulum $86\mu m$ ($86\mu m$ - $90\mu m$) in length; chelicera $98\mu m$ ($98\mu m$ - $100\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $52\mu m$ ($52\mu m$ - $55\mu m$); I-Leg-5, $55\mu m$ ($57\mu m$ - $59\mu \text{m}$); I-Leg-6, $65\mu \text{m}$ ($65\mu \text{m}$ - $67\mu \text{m}$); figure 422 illustrates these segments.

Holotype: Adult of, Shag River near its headwaters on Rt 85, 2 km west of Pigroot Summit (Central Otago), South Island, Nov. 16, 1982.

Allotype: Adult 9, same data as holotype.

Paratypes: SOUTH ISLAND: 6 of, 56 of, same data as holotype; 1 of, 7 of, White Rock River (southwest of Timaru), where Cliffs Rd branches off Pareora Cave Rd, Nov. 18, 1982; 6 of, 32 of, Rocky Gully Stream on Rt 8, between Cave and Fairlie (west of Timaru), Nov. 18, 1982.

Discussion: The male has the longest but least modified cauda found in the four known species of the subgenus *Caudaturus*. The concavities of the posteromedial plate begin much farther anterior than in the other species and the associated hyaline flaps are much longer. These flaps are best seen in lateral view (fig. 431).

71. Kritaturus (Caudaturus) tenonus, new species

(Figs. 432-439, 592)

Male: Integumental and eye pigment developed; dorsal shield $282\mu m$ (274) μ m-288 μ m) in width; anteromedial plate large and bearing the postocularia; anterolateral platelets with two pairs of glandularia and their associated setae very long; the most posterior of these setae recurved; posterolateral platelets somewhat reduced but not to the degree found in the previous species; posteromedial plate highly modified, with the two pairs of glandularia difficult to see; paired concavities present near posterior end of posteromedial plate; a pair of flaplike lobes extending posteromedially from edges of concavities, these best seen in lateral view (fig. 432); central area of posterior end of posteromedial plate raised into a hump which again is best seen in lateral view; other modifications of the dorsum better illustrated (fig. 433) than described; ventral shield $402\mu m$ $(410\mu \text{m}-418\mu \text{m})$ in length, $304\mu \text{m}$ $(304\mu \text{m}-319\mu \text{m})$ in width; first coxae projecting; glands of the fourth coxae near suture lines between third and fourth coxae; projections associated with insertions of fourth legs rounded and directed somewhat posterolaterally; posterior end of ventral shield forming a short but distinct cauda bearing the genital field; gonopore long but somewhat triangular; a hyaline flap partially covering anterior end of gonopore; a row of setae on each side near posterior end of gonopore; numerous genital acetabula; lateral patches of setae on dorsal portion of ventral shield dorsally at base of cauda (figs. 432, 433); dorsal lengths of the palpal segments: P-I, $23\mu m$ ($23\mu m$ - $25\mu m$); P-II, $57\mu m$ (56) μ m-62 μ m); P-III, 26 μ m (26 μ m-30 μ m); P-IV, 67 μ m (65 μ m-72 μ m); P-V, 27 μ m $(28\mu \text{m}-29\mu \text{m})$; structure of palp similar to that shown for female; capitulum 90 μm (93 μm -97 μm) in length; chelicera 110 μm (100 μm -114 μm) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $68\mu m$ ($69\mu m$ - $72\mu m$); I-Leg-5, $73\mu m$ ($75\mu m$ - $77\mu m$); I-Leg-6, $85\mu m$ ($80\mu m$ - $86\mu m$); dorsal lengths of the segments of the fourth leg: IV-Leg-1, $79\mu m$ ($73\mu m$ - $83\mu m$); IV-Leg-2, $79\mu m$ $(73\mu \text{m}-79\mu \text{m})$; IV-Leg-3, $83\mu \text{m}$ $(80\mu \text{m}-86\mu \text{m})$; IV-Leg-4, $107\mu \text{m}$ $(109\mu \text{m}-114)$ μ m); IV-Leg-5, 112μ m (112μ m- 118μ m); IV-Leg-6, 111μ m (104μ m- 111μ m); fourth leg exhibiting sexual dimorphism, especially noticeable is the curved, thickened seta on the ventral side of IV-Leg-2 (fig. 437).

Female: Integumental and eye pigment developed; dorsal shield 426 µm (395) $\mu m-426\mu m$) in length, $312\mu m$ ($302\mu m-319\mu m$) in width; anteromedial plate much longer and wider than posteromedial plate; area where anterolateral platelets and posteromedial plate are in contact is relatively narrow; dorsal sclerites without much ornamentation (fig. 592); ventral shield $440\mu m$ ($420\mu m-456\mu m$) in length, $334\mu m$ ($334\mu m$ - $350\mu m$) in width; first coxae projecting; glands of the fourth coxae placed near suture lines between third and fourth coxae; projections associated with insertions of fourth legs rounded and nearly covering the openings; gonopore more or less terminal and flanked by numerous acetabula (fig. 436); dorsal lengths of the palpal segments: P-I, $24\mu m$ ($22\mu m$ - $25\mu m$); P-II, $60\mu m$ ($58\mu m$ - $61\mu \text{m}$); P-III, $29\mu \text{m}$ ($27\mu \text{m}$ - $31\mu \text{m}$); P-IV, $70\mu \text{m}$ ($71\mu \text{m}$ - $76\mu \text{m}$); P-V, $29\mu \text{m}$ (27) μ m-29 μ m); modification of P-IV as described for preceding species; figure 438 shows the proportions and chaetotaxy of the palp; capitulum $104\mu m$ ($96\mu m$ - $101\mu m$) in length; chelicera $114\mu m$ ($110\mu m$ - $117\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $60\mu m$ ($59\mu m$ - $63\mu m$); I-Leg-5, $69\mu m$ ($64\mu m$ - $70\mu \text{m}$; I-Leg-6, $78\mu \text{m}$ ($72\mu \text{m}$ - $76\mu \text{m}$); figure 439 illustrates these segments.

Holotype: Adult of, Pourakino River at Pourakino Picnic Grounds (in Longwood State Forest), on Harrington Rd south of Otautau, South Island, Nov. 13,

1982.

Allotype: Adult \angle, same data as holotype.

Paratypes: 1 of, 1 \cong , same data as holotype; 8 of, 13, \cong , from a stream on

Rt 94, west of Mossburn, South Island, Nov. 13, 1982.

Discussion: The present species is most closely related to the following species. See remarks under the latter for characteristics distinguishing the males. The female of the present species may be easily recognized from all other known members of the genus by its very narrow area of contact between the anterolateral platelets and posteromedial plate (fig. 435).

72. Kritaturus (Caudaturus) rucabus, new species

(Figs. 440-444, 446-448, 593)

Male: Integumental and eye pigment well developed; dorsal shield $236\mu m$ in width; anteromedial plate very large and bearing the postocularia; anterolateral platelets with two pairs of glandularia, the associated setae long and the posterior pair noticeably curved; posterolateral platelets of moderate size and somewhat triangular; posteromedial plate highly modified, with the two pairs of glandularia difficult to see; a pair of abruptly angled concavities present in posterior half (indicated by stippled areas on figure 442); a pair of small flap-like lobes extending posteromedially over the concavities; central area of posteromedial plate posterior to concavities raised into a hump which is best seen in lateral view (fig. 440); other modifications of dorsal shield better shown (fig. 442) than described; ventral shield $342\mu m$ in length, $266\mu m$ in width; first coxae projecting far forward; glands of the fourth coxae placed near suture lines between third and fourth coxae; projections associated with insertions of fourth legs more or less rounded and projecting posterolaterally; posterior end of ventral shield forming a short, wide cauda bearing the genital field; gonopore triangular and nearly terminal; many genital acetabula present; some setae posterior to gonopore are pectinate; prominant glandularia tubercles located at edges of body lateral to anterior end of gonopore; numerous setae in patches on posterodorsal portion of ventral shield, these best seen in lateral or dorsal views (figs. 440, 442); dorsal lengths of the palpal segments: P-I, $21\mu m$; P-II, $54\mu m$; P-III, 26 μ m; P-IV, 69 μ m; P-V, 27 μ m; ventral side of P-IV flattened, the medial edge appearing as a ridge (fig. 447); capitulum $93\mu m$ in length; chelicera $100\mu m$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $62\mu m$; I-Leg-5, 68μm; I-Leg-6, 76μm; figure 443 illustrates these segments; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $69\mu m$; IV-Leg-2, $67\mu m$; N-Leg-3, $70\mu m$; N-Leg-4, $114\mu m$; N-Leg-5, $107\mu m$; N-Leg-6, $105\mu m$; some of the setae on IV-Leg-2 and 3 lengthened, thickened and curved; the proportions and chaetotaxy of the fourth leg better illustrated (fig. 444) than described.

Female: Integumental and eye pigment well developed; dorsal shield $319\mu m$ ($319\mu-338\mu m$) in length, $270\mu m$ ($258\mu m-266\mu m$) in width; anteromedial plate approximately same length as posteromedial plate; lateral platelets and anterior portion of anteromedial plate with a pattern of very small reticulations (fig. 593); ventral shield $380\mu m$ ($358\mu m-380\mu m$) in length, $304\mu m$ ($274\mu m-289\mu m$) in width; first coxae projecting far forward as in male; glands of the fourth coxae placed near suture lines between third and fourth coxae; projections associated with the insertions of fourth legs more or less rounded and projecting posterolaterally; gonopore subterminal and flanked by many acetabula; dorsal lengths of the palpal segments: P-I, $23\mu m$ ($22\mu m-25\mu m$); P-II, $54\mu m$ ($48\mu m-55\mu m$); P-III, $25\mu m$

 $(26\mu\text{m}-28\mu\text{m})$; P-IV, $69\mu\text{m}$ $(67\mu\text{m})$; P-V, $28\mu\text{m}$ $(26\mu\text{m}-27\mu\text{m})$; structure of the palp as shown for male; capitulum $90\mu\text{m}$ in length; chelicera $107\mu\text{m}$ $(104\mu\text{m}-107\mu\text{m})$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $56\mu\text{m}$ $(55\mu\text{m}-59\mu\text{m})$; I-Leg-5, $61\mu\text{m}$ $(60\mu\text{m}-64\mu\text{m})$; I-Leg-6, $67\mu\text{m}$ $(66\mu\text{m}-72\mu\text{m})$; first leg similar to that illustrated for the male.

Holotype: Adult of, from Orauhora Stream on Rt 30, between Barryville and

Bennydale, North Island, June 6, 1981.

Allotype (?): Adult \(\frac{2}{2} \), Stream on Rt. 6 just north of Makatote Viaduct, between Raetiki and National Park, North Island, Nov. 2, 1982.

Paratypes (?): 2 \, same data as allotype.

Discussion: It is not certain that the male and females are conspecific. However, these mites possess first coxae that extend much farther forward than in any of the males and females of other known species. The male was newly metamorphosed and, therefore, a comparison of the dorsal shield ornamentation was impossible. However, these females were collected in central North Island less than 100 km from the type locality, well within the probable range of the species.

The male has the shortest and widest cauda of any known species of the subgenus. It is most closely related to *K. tenonus* but the latter has a narrower cauda and narrower gonopore (compare figures 434, 441) and the modifications of the setae on the fourth leg are more complex in the present species (compare figures 437, 444). Females of the two species are easily distinguished by the comparatively much larger anteromedial plate in *tenonus*.

73. Kritaturus (Caudaturus) uncipalpis, new species

(Figs. 445, 449-455, 594)

Male: Integumental and eye pigment well developed; dorsal shield 186 µm (167 μ m-197 μ m) in width; anteromedial plate large, greatly narrowing posteriorly and bearing the postocularia; anterolateral platelets with two pairs of glandularia, the associated setae long and the posterior pair noticeably curved; posterolateral platelets reduced to small triangular sclerites; posteromedial plate highly modified with the two pairs of glandularia difficult to see; a pair of abruptly angled concavities present in posterior half (indicated by stippled area in figure 452); a pair of flap-like lobes extending posteromedially over the concavities; central area of posteromedial plate posterior to concavities raised into a hump which is best seen in lateral view (fig. 455); other modifications of the dorsal shield better illustrated (fig. 452) than described; ventral shield 308µm (296µm- $319\mu m$) in length, $209\mu m$ ($186\mu m$ - $224\mu m$) in width; first coxae projecting, tips somewhat outhooked; glands of fourth coxae near suture lines between third and fourth coxae; projections associated with insertions of fourth legs rounded and projecting posterolaterally; posterior end of ventral shield forming a cauda bearing the genital field; gonopore triangular, surrounded on the three sides by setae, and is ventral in position; many genital acetabula present; numerous setae located in patches on posterodorsal portion of ventral shield (figs. 452, 455); dorsal lengths of the palpal segments: P-I, $18\mu m$ ($19\mu m-21\mu m$); P-II, $53\mu m$ ($52\mu m 57\mu \text{m}$); P-III, $31\mu \text{m}$ ($30\mu \text{m} - 37\mu \text{m}$); P-IV, $52\mu \text{m}$ ($49\mu \text{m} - 57\mu \text{m}$); P-V, $17\mu \text{m}$ (17) μ m-19 μ m); palp uncate and is as described and illustrated for the female; capitulum $71\mu \text{m}$ ($66\mu \text{m}$ - $72\mu \text{m}$) in length; chelicera $74\mu \text{m}$ ($69\mu \text{m}$ - $79\mu \text{m}$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $50\mu m$ ($48\mu m$ - $52\mu m$); I-Leg-5, $54\mu m$ ($53\mu m$ - $58\mu m$); I-Leg-6, $63\mu m$ ($62\mu m$ - $72\mu m$); dorsal lengths of the segments of the fourth leg: IV-Leg-1, $48\mu m$ ($41\mu m$ - $55\mu m$); IV-Leg-2, $45\mu m$

 $(43\mu\text{m}-48\mu\text{m})$; IV-Leg-3 (to tip of distal projection), $72\mu\text{m}$ ($59\mu\text{m}-72\mu\text{m}$); IV-Leg-4, $62\mu\text{m}$ ($63\mu\text{m}-72\mu\text{m}$); IV-Leg-5, $73\mu\text{m}$ ($76\mu\text{m}-83\mu\text{m}$); IV-Leg-6, $76\mu\text{m}$ ($78\mu\text{m}-89\mu\text{m}$); IV-Leg-3 projecting far beyond insertion of IV-Leg-4 and this projection bearing a heavy, bifurcate seta; with rare exceptions, the legs in preserved specimens are in the position indicated in figure 445, which means this is the extended position.

Female: Integumental and eye pigment well developed; dorsal shield $273\mu m$ $(247\mu m-273\mu m)$ in length, $186\mu m$ $(182\mu m-190\mu m)$ in width; anteromedial plate slightly shorter than posteromedial plate; lateral platelets and anterior portion of anteromedial plate with a pattern of small reticulations (fig. 594); anterolateral platelets with two pairs of glandularia; the posteromedial plate with two pairs of glandularia; ventral shield $308\mu m$ ($289\mu m-319\mu m$) in length, $206\mu m$ ($194\mu m 217\mu m$) in width; first coxae projecting; glands of the fourth coxae placed near suture lines between third and fourth coxae; projections associated with insertions of fourth legs rounded and projecting posterolaterally; gonopore subterminal and flanked by many acetabula; dorsal lengths of the palpal segments: P-I, $20\mu \text{m}$ (18 μm -22 μm); P-II, 51 μm (50 μm -52 μm); P-III, 31 μm (31 μm -36 μm); P-IV, $52\mu m$ ($50\mu m - 54\mu m$); P-V, $17\mu m$ ($16\mu m - 19\mu m$); P-II with a ventral bump; distoventral portion of P-IV produced to form an uncate palp (fig. 453); capitulum 72 μm (69 μm -72 μm) in length; chelicera 76 μm (79 μm) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $41\mu m$ ($40\mu m$ - $45\mu m$); I-Leg-5, 45 μm (44 μm -47 μm); I-Leg-6, 59 μm (52 μm -59 μm); figure 449 illustrates these segments.

Holotype: Adult of, from a small cascade in a tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), North Island, Oct. 27, 1982.

Allotype: Adult \angle, same data as holotype.

Paratypes: NORTH ISLAND: 1 of, same data as holotype except mite taken in the tributary stream; 7 of, 32 \(\text{9}\), same data as holotype; 1 of, Otupoto Stream on Rt 32, west of Lake Taupo, Nov. 3, 1982; SOUTH ISLAND: 1 \(\text{9}\), Whale Creek on Rt 6, west of Murchison, Nov. 7, 1982; 2 of, 2 \(\text{9}\), Hope River on Rt 6, between Glenhope and Kawatiri, Nov. 25, 1982.

Discussion: The most striking characteristic of this species is the uncate palp, an obviously autapomorphic condition. Other members of the subgenus have an enlarged distoventral setal tubercle on P-IV (fig. 447) and it seems very likely the uncate condition has resulted from a much greater expansion of this tubercle. The sexual dimorphism of the male fourth leg, with IV-Leg-3 possessing a long distal projection bearing a heavy bifurcate seta, is strikingly different from other members of the subgenus.

74. Kritaturus (Kritaturus) sornus, new species

(Figs. 456-461, 595)

Male: Integumental and eye pigment present; dorsal shield $342\mu m$ ($327\mu m$) in length, $304\mu m$ ($312\mu m$) in width; anteromedial plate bearing the postocularia; anterolateral platelets with two pairs of glandularia; posteromedial plate with two pairs of glandularia; posteromedial plate nearly square, but slightly wider than long; figure 595 indicates the dorsal ornamentation; ventral shield $388\mu m$ ($365\mu m$) in length, $319\mu m$ ($327\mu m$) in width; first coxae relatively broad, projecting and round at tips; glands of the fourth coxae located near suture lines between third and fourth coxae; projections associated with insertions of fourth legs

roundly pointed and projecting posteriorly; genital field indistinctly set off from remainder of ventral shield; gonopore long and narrow, and nearly terminal; the genital acetabula numerous; these divided into dorsal and ventral groupings by an area of this integument which can be seen in posterior view (fig. 456); figure 457 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $25\mu m$ ($23\mu m$); P-II, $55\mu m$ ($52\mu m$); P-III, $29\mu m$ ($26\mu m$); P-IV, 66 μm (62 μm); P-V, 26 μm (24 μm); ventral side of P-II with several small tubercles; P-IV flattened ventrally and the medial edge of this flattened area appearing as a longitudinal ridge in medial view; the two ventral setae of P-IV relatively far apart in a lateral to medial direction; figure 461 shows the structure of the palp; capitulum $90\mu m$ ($87\mu m$) in length; chelicera $100\mu m$ ($96\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 60µm; I-Leg-5, 69 μm (67 μm); I-Leg-6, 72 μm (69 μm); figure 460 illustrates these segments; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $79\mu m$ ($76\mu m$); IV-Leg-2, $59\mu m$ ($58\mu m$); IV-Leg-3, $67\mu m$ ($69\mu m$); IV-Leg-4, $80\mu m$ ($79\mu m$); IV-Leg-5, $93\mu m$ ($96\mu m$); IV-Leg-6, $86\mu m$ ($84\mu m$); dorsal side of IV-Leg-1 through 4 with long setae; figure 459 shows the proportions and chaetotaxy of the fourth leg.

Female: Unknown.

Holotype: Adult of, Pourakino River at Pourakino Picnic Grounds (in Longwood State Forest), on Harrington Rd south of Otautau, South Island, Nov. 31, 1982.

Paratype: 1 of, same data as holotype.

Discussion: The palp, with its longitudinal ridge on P-IV and tubercles on P-II, is much more like that found in members of the subgenus *Caudaturus*. However, the present species lacks both the sexual dimorphism of the male body and fourth leg characteristic of that subgenus.

75. Kritaturus (?Kritaturus) ianthus, new species

(Figs. 462-465, 596)

Female: Integumental and eye pigment well developed; dorsal shield $349\mu m$ $(304\mu m-349\mu m)$ in length, $266\mu m$ $(228\mu m-258\mu m)$ in width; anteromedial plate bearing the postocularia; anterolateral platelets with two pairs of glandularia; posteromedial plate with two pairs of glandularia; anteromedial plate and the anterolateral platelets colored a deep purple, other dorsal sclerites light colored; posteromedial plate noticeably longer than the anteromedial plate; figure 596 shows the ornamentation of the dorsal shield; ventral shield $403\mu m$ ($365\mu m$ - $395\mu m$) in length, $278\mu m$ ($243\mu m$ – $278\mu m$) in width; first coxae projecting, with tips more or less rounded; glands of the fourth coxae placed near suture lines between third and fourth coxae; projections associated with insertions of fourth legs rounded and directed posterolaterally; gonopore more or less terminal; with many acetabula in three or four rows along posterior margin (fig. 463); dorsal lengths of the palpal segments: P-I, $21\mu m$ ($19\mu m-22\mu m$); P-II, $55\mu m$ $(49\mu \text{m} - 56\mu \text{m})$; P-III, $24\mu \text{m}$ $(24\mu \text{m} - 26\mu \text{m})$; P-IV, $72\mu \text{m}$ $(68\mu \text{m} - 76\mu \text{m})$; P-V, 38 μm (36 μm -38 μm); ventral side of P-II with several small papillae; P-IV flattened ventrally and the medial edge of this flattened area appearing as a longitudinal ridge in medial view; the two ventral setae of P-IV far apart in a lateral to medial direction; figure 462 shows the proportions and chaetotaxy of the palp; capitulum $93\mu m$ ($86\mu m$ – $98\mu m$) in length; chelicera $100\mu m$ ($100\mu m$ – $104\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $52\mu m$ (45)

 μ m-50 μ m); I-Leg-5, 61 μ m (57 μ m-62 μ m); I-Leg-6, 72 μ m (69 μ m-72 μ m); figure 464 illustrates these segments.

Male: Unknown.

Holotype: Adult \(\begin{aligned} \text{Pourakino River at Pourakino Picnic Grounds (in Longwood State Forest) on Harrington Rd south of Otautau, South Island, Nov. 13, 1982.

Paratypes: NORTH ISLAND: 1 \(\), Kareaara Stream, 14 km east of turnoff (Rt 5) to Taupo, June 4, 1981; 2 \(\), river at Broadwood in northern North Island, Oct. 21, 1982; 1 \(\), tributary of Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), Oct. 27, 1982; 1 \(\), Orauhora Stream on Rt 30, between Barryville and Benneydale, Oct. 31, 1982; 1 \(\), Mangamawhete Stream on Rt 3, between Inglewood and Stratford (Egmont area), Nov. 1, 1982; SOUTH ISLAND: Opouri River between Carluke and Opouri Valley on Tennyson Inlet Rd, Nov. 6, 1982; 2 \(\), Hope River on Rt 6, between Glenhope and Kawatiri, Nov. 25, 1982.

Discussion: The color pattern, with the very dark anteromedial plate and anterolateral platelets contrasting with the lightly colored other sclerites of the dorsum is diagnostic. The palpal structure and morphology of the first coxae are similar to that found both in the previous species and members of the subgenus Caudaturus. Therefore, until the male is known, subgeneric placement is uncertain. It is surprising that a male was not taken for, although this species was never common in any one collection, it was taken in eight widely scattered localities on both islands, and was collected in June, October and November.

76. Kritaturus (Kritaturus) gennadus, new species

(Figs. 466-470, 472, 597)

Male: Integumental and eye pigment well developed; dorsal shield $293\mu m$ $(282\mu m)$ in length, $221\mu m$ $(213\mu m)$ in width; anteromedial plate bearing the postocularia; anterolateral platelets with two pairs of glandularia; posteromedial plate with two pairs of glandularia; ornamentation of dorsal shield as shown for the female (fig. 597); ventral shield $354\mu m$ (338 μm) in length, $232\mu m$ (235 μm) in width; first coxae projecting far forward and sharp-pointed; glands of the fourth coxae located near suture lines between third and fourth coxae; projections associated with insertions of fourth legs roundly pointed and directed more or less posteriorly; posterior suture lines of fourth coxae well developed, extending to midline and continuing forward as a medial suture line (fig. 469); genital field distinctly set off from remainder of ventral shield; gonopore small, oval, subterminal and flanked by two pairs of setae; genital acetabula numerous; dorsal lengths of the palpal segments: P-I, $21\mu m$ ($20\mu m$); P-II, $59\mu m$ ($54\mu m$); P-III, $25\mu m$ ($26\mu m$); P-IV, $104\mu m$ ($97\mu m$); P-V, $35\mu m$ ($34\mu m$); structure of the palp as described and illustrated for the female; capitulum $100\mu m$ (97 μm) in length; chelicera $97\mu m$ ($90\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $52\mu m$ (48 μm); I-Leg-5, $62\mu m$ (56 μm); I-Leg-6, $67\mu m$ $(62\mu m)$; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $48\mu m$ (45) μ m); IV-Leg-2, 45 μ m (44 μ m); IV-Leg-3, 45 μ m (47 μ m); IV-Leg-4, 53 μ m (55 μ m); IV-Leg-5, 67 μ m (65 μ m); IV-Leg-6, 69 μ m (72 μ m); fourth leg relatively unmodified, its structure better illustraled (fig. 466) than described.

Female: Integumental and eye pigment well developed; dorsal shield $308\mu m$ (334 μm) in length, $243\mu m$ (258 μm) in width; dorsal shield as described for the

male; figure 597 shows the ornamentation of the dorsal shield; ventral shield 373 μ m (395 μ m) in length, 273 μ m (281 μ m) in width; coxal region as described for the male except posterior and medial suture lines of fourth coxae are not developed; genital field distinctly set off from rest of ventral shield; gonopore of moderate size and nearly terminal; genital acetabula numerous; dorsal lengths of the palpal segments: P-I, 22 μ m (21 μ m); P-II, 52 μ m; P-III, 29 μ m (27 μ m); P-IV, 113 μ m (98 μ m); P-V, 34 μ m; P-IV without a medial ridge, ventral setae of P-IV relatively close together in a lateral to medial direction; no tubercles on ventral side of P-II; figure 472 illustrates the proportions and chaetotaxy of the palp; capitulum 104 μ m (100 μ m) in length; chelicera 93 μ m (100 μ m) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 48 μ m; I-Leg-5, 58 μ m (60 μ m); I-Leg-6, 69 μ m; figure 470 illustrates these segments.

Holotype: Adult of, Four Mile River on Rt 6, between Charleston and Tiro-

moana, South Island, Nov. 8, 1982.

Allotype: Adult 9, same data as holotype.

Paratypes: 1 of, 1 af, Opouri River between Carluke and Opouri Valley on

Tennyson Inlet Rd, South Island, Nov. 6, 1982.

Discussion: The present species is the type for the subgenus. The following two species and it are more typical members of the subgenus. They are characterized by a palp without papillae on P-II and no ridge on P-IV (i.e., ventral side of P-IV is not flattened), and the ventral setae on P-IV are relatively close together in a lateral to medial direction. Also, the tips of the first coxae are more or less sharp-pointed. The present species is easily distinguished by the very sharp-pointed tips of the first coxae and by their possession of a genital field distinctly set off from remainder of ventral shield. The well developed medial and posterior suture lines of the male fourth coxae are also diagnostic for that sex.

77. Kritaturus (Kritaturus) dornarus, new species

(Figs. 471, 473-475, 480, 481, 598)

Male: Integumental and eye pigment well developed; dorsal shield $247\mu m$ in length, 213 µm in width; anteromedial plate bearing the postocularia; anterolateral platelets with two pairs of glandularia; posteromedial plate with two pairs of glandularia; ornamentation of dorsal shield as shown for the female (fig. 598); ventral shield 327 µm in length, 236 µm in width; first coxae projecting and are somewhat pointed; glands of the fourth coxae located near suture lines between third and fourth coxae; projections associated with insertions of fourth legs are roundly pointed and directed more or less posteriorly; posterior suture lines of fourth coxae poorly developed; genital field not set off from remainder of ventral shield; gonopore small, somewhat triangular, and surrounded on three sides by setae (fig. 480); genital acetabula numerous; dorsal lengths of the palpal segments: P-I, $21\mu m$; P-II, $59\mu m$; P-III, $27\mu m$; P-IV, $107\mu m$; P-V, $40\mu m$; capitulum $89\mu m$ in length; chelicera $96\mu m$ in length; structure of mouthparts as shown for the female; dorsal lengths of the distal segments of the first leg: I-Leg-4, 62μm; I-Leg-5, 76μm; I-Leg-6, 86μm; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $57\mu m$; IV-Leg-2, $46\mu m$; IV-Leg-3, $55\mu m$; IV-Leg-4, 69 μ m; IV-Leg-5, 81 μ m; IV-Leg-6, 79 μ m; fourth leg relatively unmodified, its structure better illustrated (fig. 473) than described.

Female: Integumental and eye pigment well developed; dorsal shield $304\mu m$ in length, $212\mu m$ in width; dorsal shield as described for the male; figure 598

shows the ornamentation of the dorsal shield; ventral shield $349\mu m$ in length, $243\mu m$ in width; ventral shield, except for genital field region, as described for male; gonopore nearly terminal and flanked by numerous genital acetabula; genital field area not set off from remainder of ventral shield; figure 481 illustrates the ventral shield; dorsal lengths of the palpal segments: P-I, $22\mu m$; P-II, $59\mu m$; P-III, $28\mu m$; P-IV, $99\mu m$; P-V, $41\mu m$; P-IV without a medial ridge, ventral setae of P-IV close together in a lateral to medial direction; no tubercles on the ventral side of P-II; capitulum $87\mu m$ in length; chelicera $96\mu m$ in length; figure 475 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $52\mu m$; I-Leg-5, $59\mu m$; I-Leg-6, $69\mu m$; figure 474 shows these segments.

Holotype: Adult of, from a small cascade in a tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), North Island,

Oct. 27, 1982.

Allotype: Adult \(\bar{1} \), same data as holotype.

Discussion: The combination of no sexual dimorphism of the body or legs and triangular gonopore are diagnostic for the male. Characters given in the key will distinguish the female.

78. Kritaturus (Kritaturus) vinnulus, new species

(Figs. 476-479, 599)

Female: Integumental and eye pigment developed; dorsal shield 319 µm (319) μ m) in length, 243 μ m (251 μ m) in width; anteromedial plate bearing the postocularia; anterolateral platelets with two pairs of glandularia; Posteromedial plate with two pairs of glandularia; ornamentation of dorsal shield shown in figure 599; ventral shield $354\mu m$ ($365\mu m$) in length, $243\mu m$ ($258\mu m$) in width; anterior coxae projecting and somewhat pointed; glands of the fourth coxae located noticeably posterior to suture lines between third and fourth coxae; projections associated with insertions of fourth legs rounded and projecting more or less posteriorly; posterior suture lines of fourth coxae obliterated; genital field not set off from the remainder of the ventral shield; gonopore somewhat subterminal and flanked by numerous acetabula; figure 476 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $18\mu m$ ($22\mu m$); P-II, $51\mu m$ ($52\mu m$); P-III, $24\mu m$ ($26\mu m$); P-IV, $76\mu m$ ($79\mu m$); P-V, $41\mu m$ ($38\mu m$); P-IV without a median ridge, ventral setae on P-IV close together in a lateral to medial direction; P-II without ventral tubercles; figure 479 shows the proportions and chaetotaxy of the palp; capitulum $86\mu m$ ($85\mu m$) in length; chelicera $98\mu m$ ($104\mu m$) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $46\mu m$ ($49\mu m$); I-Leg-5, $52\mu m$ ($55\mu m$); I-Leg-6, $69\mu m$ ($69\mu m$); figure 477 shows these segments.

Male: Unknown:

Holotype: Adult 4, Shag River near its headwaters, on Rt 85, 2 km west of Pigroot Summit (Central Otago), South Island, Nov. 16, 1982.

Paratype: 1 \(\frac{1}{2} \), Pourakino River at Pourakino Picnic Grounds (in Longwood State Forest), on Harrington Rd south of Otautau, South Island, Nov. 13, 1982.

Discussion: The present species, based on the female only, seems most closely related to the previous species, *K. dornarus*, but the latter has a proportionally much longer P-IV (compare figures 475, 479) and there is a difference in the color pattern of the dorsal shield which is described as a part of the key to species.

Genus URALBIA Hopkins

Uralbia Hopkins, 1967. Trans. Royal Soc. New Zealand, 10: 44.

Diagnosis: Characters of the New Zealand Notoaturinae; anteromedial plate bearing widely spaced postocularia; anterolateral platelets with one pair of glandularia with long associated setae; posterolateral platelets with a pair of long setae which are the homologs of glandularia (gland portion has disappeared); the posteromedial plate with two pairs of setae which are the homologs of glandularia; excretory pore lying on the posteromedial plate in the female; dorsum without ornamentation (fig. 600); coxae projecting far forward and pointed; no intercoxal slots present; capitular bay long and comparatively narrow; suture lines of fourth coxae apparent for only a short distance medial to insertions of fourth legs; projections associated with insertions of fourth legs large and rounded; glands of the fourth coxae near suture lines between third and fourth coxae; many genital acetabula present; female gonopore large and terminal (fig. 482); male genital field with paired acetabula-bearing lobes extending posterior to gonopore (fig. 484); palpal segments elongated, P-II with spine-like cuticular projections on ventral side (fig. 492); male fourth leg exhibiting a sexual dimorphism in the proportions of the segments and in the setae of IV-Leg-3 and 4.

Type Species: Uralbia projecta Hopkins.

Discussion: This genus is so distinctive it needs no further characterization. One interesting aspect of the genus is that it provides another example of an interstitial group in which the gland portion of the glandularia has disappeared. This obliteration of the glands has occurred independently in several completely unrelated families from the hyporheic habitat, but I know of only one example of its occurance in a species living in superficial waters. That example is the New Zealand species *Aciculacarus papillosus* Hopkins, in which two of the dorsal glandularia pairs have lost the gland portion.

79. Uralbia gracilipes, new species

(Figs. 482-487, 492, 600)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 349 μm (349 μm -380 μm) in length, 308 μm (318 μm -327 μm) in width; anteromedial plate bearing laterally placed postocularia; anterolateral platelets with one pair of glandularia, the associated setae long; posterolateral platelets with the homologs of a pair of glandularia, but the gland portion has disappeared, leaving only the associated setae; posteromedial plate with the homologs of two pairs of glandularia, but here also the gland portion has disappeared, leaving only the setae to mark the locations (fig. 486); excretory pore placed on dorsal portion of ventral shield; ventral shield $608\mu m$ ($597\mu m-646\mu m$) in length, $334\mu m$ ($341\mu m-360\mu m$) in width; coxae projecting far forward and pointed; capitular bay very long and narrow; glands of the fourth coxae placed near suture lines between third and fourth coxae; projections associated with insertions of fourth legs rounded; posterior suture lines of fourth coxae evident for only a short distance medial to insertions of fourth legs; genital field projecting beyond body; genital field consisting of paired posteriorly directed lobes bearing the acetabula; gonopore small but gradually widening posteriorly when viewed ventrally; end of ventral shield with a bluntly pointed projection bearing a ventral keel; genital field area better illustrated (fig. 484) than described; dorsal lengths of the palpal segments: P-I,

74μm (71μm-74μm); P-II, 121μm (119μm-128μm); P-III, 106μm (102μm-114μm); P-IV, 276μm (266μm-310μm); P-V, 34μm (33μm-35μm); palp as described for the female; capitulum 162μ m (157μ m- 173μ m) in length; chelicera 134μ m (128μ m- 131μ m) in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 100μ m (90μ m- 104μ m); I-Leg-5, 135μ m (121μ m- 138μ m); I-Leg-6, 131μ m (134μ m- 145μ m); dorsal lengths of the segments of the fourth leg: IV-Leg-1, 133μ m (133μ m- 140μ m); IV-Leg-2, 199μ m (165μ m- 192μ m); IV-Leg-3, 140μ m (129μ m- 140μ m); IV-Leg-4, 192μ m (177μ m- 207μ m); IV-Leg-5, 273μ m (236μ m- 273μ m); IV-Leg-6, 200μ m (178μ m- 192μ m); segments of fourth leg relatively narrow; medial surface of IV-Leg-3 and 4 with numerous, somewhat thickened setae, these better illustrated (fig. 483) than described; setae on IV-Leg-3 somewhat foreshortened in the illustration.

Female: Integumental pigment absent, eye pigment reduced; dorsal shield $440\mu\mathrm{m}$ ($388\mu\mathrm{m}$ - $420\mu\mathrm{m}$) in length, $319\mu\mathrm{m}$ ($289\mu\mathrm{m}$ - $334\mu\mathrm{m}$) in width; structure of dorsal shield as described for the male but posteromedial plate is proportionally much longer and bears the excretory pore (compare figures 485, 486); figure 600 is a photograph of the dorsal shield; ventral shield $638\mu m$ ($593\mu m-646\mu m$) in length, $349\mu m$ ($320\mu m-364\mu m$) in width; anterior portion of ventral shield as described for male; distance from fourth coxae to posterior end of ventral shield much greater than in male; gonopore terminal and relatively large; many acetabula present, most of which are terminal in position (fig. 482); dorsal lengths of the palpal segments: P-I, $72\mu m$ ($70\mu m - 72\mu m$); P-II, $121\mu m$ ($117\mu m - 124\mu m$); P-III, $107\mu m$ ($104\mu m$); P-IV, $266\mu m$ ($259\mu m$ - $270\mu m$); P-V, $35\mu m$; P-II with several long, pointed cuticular projections on proximal portion of ventral side; figure 492 shows the proportions and chaetotaxy of the palp; capitulum $169\mu m$ $(157\mu \text{m}-166\mu \text{m})$ in length; chelicera $134\mu \text{m}$ $(124\mu \text{m}-130\mu \text{m})$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $86\mu m$ ($80\mu m$ - $90\mu m$); I-Leg-5, $117\mu m$ ($104\mu m$ - $118\mu m$); I-Leg-6, $117\mu m$ ($114\mu m$ - $121\mu m$); figure 487 illustrates these segments.

Holotype: Adult of, Kaituna River on Rt 6, 5 km south of Havelock, northern South Island, Nov. 22, 1982.

Allotype: Adult 9, same data as holotype.

Paratypes: SOUTH ISLAND: 1 of, 3 of, tributary of Wakamarina River, 7 km southeast of Canvastown (off Rt 6), Nov. 5, 1982; 1 of, tributary of Whangamoa River on Rt 6, slightly west of Rai Saddle (at Collins Valley Picnic Grounds), Nov. 6, 1982; 8 of, 4 of, Whale Creek on Rt 6, west of Murchison, Nov. 7, 1982; 2 of, 3 of, same data as holotype; 1 of, 1 of, small creek on Rt 6, approx. 10 km west of Havelock, Nov. 22, 1982; 2 of, tributary of Whangamoa River on Rt 6, just west of Rai Saddle (at Collins Valley Picnic Grounds), Nov. 22, 1982; 1 of, tributary of the Motupiko River on Rt 6, between Korere and Glenhope, Nov. 25, 1982.

Discussion: Males of the present species and the following are closely related (see remarks under the latter for characters separating the two) and may be distinguished from the type species, *U. projecta* hopkins, in having a posteromedial projection on the ventral shield in males (compare figures 484 and 489 with 502), and much less stocky segments of the male fourth leg (compare figures 483 and 488 with 494). Females of the present species have a proportionally much longer and narrower P-III than in *projecta* (compare figures 491 and 492).

80. Uralbia parva, new species

(Figs. 488-490, 493)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 278 μ m in length, 243 μ m in width; anteromedial plate bearing the laterally placed postocularia; anterolateral platelets with one pair of glandularia; posterolateral platelets with the homologs of one pair of glandularia, but the gland portions have disappeared leaving only the associated setae; posteromedial plate with the homologs of two pairs of glandularia (fig. 490); excretory pore located on dorsal side of ventral shield; ventral shield 486 \mu in length, 266 \mu in width; anterior coxae projecting far forward and pointed; capitular bay very long and narrow; glands of the fourth coxae located at edge of suture lines between the third and fourth coxae; projections associated with insertions of fourth legs rounded and pointed posteromedially; posterior suture lines of fourth coxae evident for a short distance medial to insertions of fourth legs; genital field projecting beyond body; genital field consisting of paired posteriorly directed, pointed lobes bearing the acetabula; gonopore very small and tapering posteriorly when viewed ventrally; end of ventral shield with a pointed, triangular projection bearing a ventral keel; genital field area better illustrated (fig. 489) than described; dorsal lengths of the palpal segments: P-I, $55\mu m$; P-II, $87\mu m$; P-III, $79\mu m$; P-IV, $207\mu \text{m}$; P-V, $27\mu \text{m}$; a few long, sharp cuticular projections on ventral side of P-II; figure 493 illustrates the proportions and chaetotaxy of the palp; capitulum $124\mu\mathrm{m}$ in length; chelicera $100\mu\mathrm{m}$ in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, 73µm; I-Leg-5, 104µm; I-Leg-6, 115µm; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $103\mu m$; IV-Leg-2, $140\mu m$; IV-Leg-3, $105\mu m$; W-Leg-4, $148\mu m$; W-Leg-5, $177\mu m$; W-Leg-6, $143\mu m$; segments of fourth leg relatively narrow as in the previous species; medial surface of IV-Leg-3 and 4 bearing many setae, but these not nearly as numerous as in the previous species (compare figures 483, 488).

Female: Unknown.

Holotype: Adult of, Waimana River in the "Gorge" between Tameatura and Opotiki, North Island, Oct. 28, 1982.

Discussion: The present species is closely related to gracilipes but is much smaller and varies in details of the genital field region. The posteriorly directed lobes of the present species are more sharply pointed and bear fewer acetabula, and the gonopore is much narrower. Also, the posterior projection of the ventral shield is comparatively much larger in parva. The fourth leg of the present species bears fewer setae on IV-Leg-3 and 4 than in the related species.

81. Uralbia projecta Hopkins

(Figs. 491, 494-499, 502)

Uralbia projecta Hopkins, 1967. Trans. Royal Soc. New Zealand, 10: 44.

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 369 μ m- $\overline{410}\mu$ m in length, 319μ m- 350μ m in width; anteromedial plate bearing the laterally placed postocularia; anterolateral platelets with one pair of glandularia, the associated setae long; posteromedial platelets with the homologs of a pair of glandularia, but the gland portion has disappeared leaving the associated setae to mark the location; posteromedial plate with the homologs of two pairs of gland-

ularia, but here also the gland portions have disappeared leaving only the associated setae (fig. 498); excretory pore placed on dorsal portion of ventral shield; ventral shield $608\mu \text{m}$ - $637\mu \text{m}$ in length, $380\mu \text{m}$ - $395\mu \text{m}$ in width; anterior coxae projecting far forward and are pointed; capitular bay long and narrow; glands of the fourth coxae placed near suture lines of third coxae; projections associated with insertions of fourth legs rounded and located near lateral edges of body; posterior suture lines of fourth coxae well developed; genital field projecting beyond body; genital field consisting of posteriorly-directed lobes bearing the acetabula; gonopore located where the two lobes join anteriorly; end of ventral shield lacking the median projection so characteristic of the previous two species; genital field area better illustrated (fig. 502) than described; dorsal lengths of the palpal segments: P-I, $60\mu \text{m} - 69\mu \text{m}$; P-II, $100\mu \text{m} - 107\mu \text{m}$; P-III, $76\mu \text{m} - 79\mu \text{m}$; P-IV, $229\mu\text{m}-256\mu\text{m}$; P-V, $28\mu\text{m}-32\mu\text{m}$; palp as illustrated for the female; capitulum 141μ m- 155μ m in length; chelicera 121μ m- 125μ m in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $88\mu m$ - $90\mu m$; I-Leg-5, $111\mu m$ - $118\mu m$; I-Leg-6, $124\mu m$ - $128\mu m$; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $118\mu m-133\mu m$; IV-Leg-2, $185\mu m-207\mu m$; IV-Leg-3, $144\mu m-155\mu m$; IV-Leg-4, $177\mu\text{m}$ -199 μm ; IV-Leg-5, $207\mu\text{m}$ -222 μm ; IV-Leg-6, $155\mu\text{m}$ -168 μm ; leg segments stocky and with patches of thickened setae on medial surfaces of IV-Leg-3 and 4; these setae foreshortened in figure 494, figure 499 shows the true length of the thickened setae on IV-Leg-4.

Female: Integumental pigment absent, eye pigment reduced; dorsal shield $440\mu \text{m}$ - $471\mu \text{m}$ in length, $312\mu \text{m}$ - $334\mu \text{m}$ in width; structure of dorsal shield as described for male but posteromedial plate proportionally much longer and it bears the excretory pore; figure 495 shows the proportions of the sclerites of the dorsal shield; ornamentation of the dorsal shield similar to that of U. gracilipes (fig. 600); ventral shield $612\mu m$ - $669\mu m$ in length, $342\mu m$ - $380\mu m$ in width; anterior portion of ventral shield as described for male; suture lines of fourth coxae less well developed than in male and distance from fourth coxae to posterior end much greater; gonopore terminal and relatively large; many acetabula present, most of which are terminal in position (fig. 496); dorsal lengths of the palpal segments: P-I, $62\mu m$ - $69\mu m$; P-II, $97\mu m$ - $104\mu m$; P-III, $74\mu m$ - $79\mu m$; P-IV, $222\mu \text{m}-237\mu \text{m}$; P-V, $31\mu \text{m}-33\mu \text{m}$; ventral side of P-II with several long, sharp cuticular projections; capitulum $148\mu \text{m}$ - $157\mu \text{m}$ in length; chelicera $128\mu \text{m}$ - $135\mu m$ in length; figure 491 shows a lateral view of the capitulum, chelicera and palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 76µm-82 μ m; I-Leg-5, 104μ m- 106μ m; I-Leg-6, 109μ m- 112μ m; figure 497 shows these segments.

Material Examined: NORTH ISLAND: 1 of, stream on Wainui Rd, 5 km west of Mahinepua Rd in northern North Island, Oct. 22, 1982; 1 \(\frac{1}{2}\), tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), Oct. 27, 1982; SOUTH ISLAND: 2 \(\frac{1}{2}\), tributary of Wakamarina River 7 km southeast of Canvastown (off Rt 6), Nov. 5, 1982; 1 of, 1 \(\frac{1}{2}\), Graham Stream on Rt 6, at picnic grounds 8 km northeast of Whangamoa Saddle, Nov. 23, 1982; 2 of, 2 \(\frac{1}{2}\), Whangamoa River on Rt 6, approx. 5 km northeast of Whangamoa Saddle, Nov. 23, 1982.

Discussion: The thickened fourth leg and lack of a median projection at the posterior end of the ventral shield is diagnostic for the male of the present species. The present female may be distinguished from gracilipes (female of parva unknown) by its proportionally much shorter P-III and the proportions of the sclrites of the dorsal shield. In projecta, the posterolateral plate is proportionally much longer and the posterior tips of the posterolateral platelets end much farther anteriorly (compare figures 485, 495).

Genus ZELANDALBIA Imamura

Zelandalbia Imamura, 1978. Jour. Speleolog. Soc. Japan, 3: 41.

Diagnosis (Based on female only, male unknown): Characters of the New Zealand Notoaturinae; anteromedial plate large and bearing the close set post-ocularia; both the anterolateral and posterolateral platelets each bearing a pair of glandularia; posteromedial plate with two pairs of glandularia (fig. 500); excretory pore lying on the posteromedial plate in female; dorsum without ornamentation (fig. 601); first coxae sharp-pointed and projecting beyond body in the type species but not to the anterior end in the species described in this paper; suture lines of fourth coxae obliterated; projections associated with insertions of fourth legs large and rounded; glands of the fourth coxae near suture lines between third and fourth coxae; female gonopore terminal; several pairs of genital acetabula present; genital field distinctly set off from remainder of ventral shield in type species but not in second species to be described in this paper; palpal segments elongated in the type species, shorter in the second species; without projections on ventral side of P-II; leg segments dorsoventrally expanded and laterally compressed (figs. 503, 505); no intercoxal slots present.

Type Species: Zelandalbia hopkinsi (Imamura).

Discussion: The dorsoventrally expanded and laterally compressed condition of the legs is superficially similar to that found in *Planaturus* and *Taintaturus*, but the second segment is not elongated on the fourth leg of the present genus and there are no intercoxal slots to receive the legs. There is no question but this compressed condition of the legs has evolved twice in very unrelated groups within the subfamily Notoaturinae. *Zelandalbia* was originally described as a subgenus of *Uralbia* but the differences seem sufficient to deserve generic separation.

82. Zelandalbia imamurai, new species

(Figs. 500, 501, 503-505, 509, 601)

Female: Integumental pigment absent, eye pigment reduced; dorsal shield $300\mu m$ in length, $237\mu m$ in width; anteromedial plate bearing the postocularia and lightly fused anteriorly with the ventral shield; anterolateral and posterolateral platelets each bearing a glandularium; posteromedial plate with two pairs of glandularia; all associated setae short; posterior end of posteromedial plate indented to accommodate a portion of the gonopore; excretory pore lying on the posteromedial plate; figures 500 and 601 show the structure of the dorsum; ventral shield $333\mu m$ in length, $264\mu m$ in width; anterior coxae moderately long and pointed, but not extending beyond edge of body; a ridge present on each side extending anterolaterally from region of third coxae; glands of the fourth coxae placed near suture lines between third and fourth coxae; projections associated with insertions of fourth legs rounded and directed posterolaterally; a ridge on each side extending posterolaterally from region of insertion of fourth legs; two pairs of glandularia close together on their respecitive sides located at posterior end of these ridges; gonopore terminal; genital acetabula located at posterior end; figure 501 illustrates the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $24\mu m$; P-II, $40\mu m$; P-III, $31\mu m$; P-IV, $65\mu m$; P-V, 31μ m; structure of palp and its chaetotaxy very simple (fig. 509); capitulum 83 μ m in length; chelicera 86 μ m in length; figure 504 shows a lateral view of the

capitulum; dorsal lengths of the segments of the first leg: I-Leg-1, $31\mu\text{m}$; I-Leg-2, $27\mu\text{m}$; I-Leg-3, $28\mu\text{m}$; I-Leg-4, $36\mu\text{m}$; I-Leg-5, $38\mu\text{m}$; I-Leg-6, $48\mu\text{m}$; segments tending to be high and laterally compressed; figure 503 shows the structure of the first leg, but second and third legs are very similar; dorsal lengths of the segments of the fourth leg: IV-Leg-1, $24\mu\text{m}$; IV-Leg-2, $26\mu\text{m}$; IV-Leg-3, $26\mu\text{m}$; IV-Leg-4, $27\mu\text{m}$; IV-Leg-5, $25\mu\text{m}$; IV-Leg-6, $41\mu\text{m}$; figure 505 illustrates these segments.

Male: Unknown.

Holotype: Adult 9, from Cole Creek on Rt 6, between Lake Moeraki and

Haast, South Island, Nov. 10, 1982.

Discussion: The legs of the present species are similar to those illustrated for \overline{Z} . hopkinsi (Imamura) but the palp, though similar in general structure and chaetotaxy, is much shorter. Z. hopkinsi has palpal proportions more like those found in Uralbia. Imamura's species has a proportionally longer body, a much broader anterior rim of the ventral shield, the genital field distinctly set off from the remainder of the body and the glandularia of the posterior portion of the ventral shield arranged very differently.

Family MOMONIIDAE Viets

Genus NEOMOMONIA Cook

Neomomonia Cook, 1968. Proc. Ent. Soc. Washington, 70: 211.

Diagnosis: Characters of the family Momoniidae as given by Cook (1974); dorsal and ventral shields present; dorsal shield divided into a smaller anterior plate and much larger posterior plate; all coxae solidly fused with ventral shield; three pairs of acetabula; acetabula lying on acetabular plates lying free in the integument in the female; female acetabular plates extending decidedly posterolaterally and followed by a large posterior plate which incorporates the postgenital sclerite, excretory pore and a pair of glandularia (fig. 506); male genital field completely fused with the ventral shield, but the acetabula lying free but relatively close together medially in the narrow gonopore (fig. 507); generally with numerous long setae in patches posterior to the insertions of the fourth legs and a small rounded clear area in the integument lateral to these setae (but both these structures reduced in one of the species); I-Leg-6 only slightly widened laterally to medially; P-V with two heavy terminal setae of approximately the same size.

Type Species: Neomomonia torquipes (Hopkins).

Discussion: Neomomonia was originally described as a subgenus of Stygomomonia. However, with males now taken for the first time, and these with the genital acetabula lying free in the gonopore, it is obvious that the New Zealand mites must be shifted from the Stygomomoniinae to the Momoniinae. Neomomonia differs from both Momonia and Momoniella in being a much more dorsoventrally flattened, colorless interstitial group in which P-V has two distal heavy setae of about equal size (fig. 510). The other two genera have one seta at tip of P-V much larger than the rest (fig. 533). Also, the anterior coxal groups are separated from the remainder of the ventral shield by articular membrane in Momonia. Momoniella has an entire dorsal shield, a greater development of the dorsal portion of the camerostome plus a very different arrangement of the dorsal glandularia. As far as is known, Neomomonia is confined to New Zealand.

83. Neomomonia torquipes (Hopkins)

(Figs. 506-508, 510, 513)

Stygomomonia torquipes Hopkins, 1966. Trans. Royal Soc. New Zealand, 8: 115. Stygomomonia (Neomomonia) torquipes Cook, 1968. Proc. Ent. Soc. Washington, 70: 211.

Male: Integumental pigment absent, eye pigment developed; dorsal shield $562\mu m-566\mu m$ in length, $365\mu m-376\mu m$ in width; dorsal shield divided into a smaller anterior plate and a much larger posterior plate; anterior plate 141µm- $148\mu \mathrm{m}$ in length, $300\mu \mathrm{m}$ - $305\mu \mathrm{m}$ in width; posterior plate bearing three pairs of glandularia and is closely flanked by five pairs of glandularia sclerites (fig. 508); ventral shield $623\mu \text{m}$ - $631\mu \text{m}$ in length, $401\mu \text{m}$ - $414\mu \text{m}$ in width; anterior coxae projecting beyond body; suture lines between third and fourth coxae extending anterolaterally more or less in a gradual arc; projections associated with the insertions of fourth legs well developed; a patch of 8-10 long setae on each side posterior to insertions of fourth legs; a small clear area in the integument on each side immediately lateral to the bases of these setae; gonopore 96 µm in length; three pairs of genital acetabula, these nearly touching in the midline; excretory pore terminal; figure 507 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $17\mu m$ - $19\mu m$; P-II, $66\mu m$ - $68\mu m$; P-III, $37\mu\text{m}$ - $38\mu\text{m}$; P-IV, $65\mu\text{m}$ - $69\mu\text{m}$; P-V, $38\mu\text{m}$ - $39\mu\text{m}$; structure of palp as described and illustrated for female; dorsal lengths of the distal segments of the first leg: I-Leg-4, 71μ m- 74μ m (greatest height of this segment 35μ m- 37μ m); I-Leg-5, $145\mu\text{m}$ - $156\mu\text{m}$; I-Leg-6, $76\mu\text{m}$ - $80\mu\text{m}$; dorsal projection at proximal end of I-Leg-6 almost directly above origin of this segment; the two pointed extensions on this dorsal projection relatively far apart; subapical lobe of claw placed rather far proximal to tip; morphology of first leg as shown for female.

Female: Dorsum as described for male; dorsal shield $517\mu m-593\mu m$ in length, 364μ m- 410μ m in width; anterior plate of dorsal shield 129μ m- 162μ m in length, $299\mu\text{m}-337\mu\text{m}$ in width; ventral shield $562\mu\text{m}-638\mu\text{m}$ in length, $380\mu\text{m}-$ 456μm in width; except for genital field region, ventral shield as described for male; posterior margins of fourth coxae more rounded and much farther anterior to genital field than in male; three pairs of genital acetabula, these located on small sclerites and arranged in an outward curve; postgenital sclerite fused with a broad, arc-like sclerite which bears the excretory pore and a pair of glandularia (fig. 506); dorsal lengths of the palpal segments: P-I, $17\mu m-20\mu m$; P-II, $63\mu \text{m} - 66\mu \text{m}$; P-III, $38\mu \text{m} - 42\mu \text{m}$; P-IV, $64\mu \text{m} - 70\mu \text{m}$; P-V, $36\mu \text{m} - 41\mu \text{m}$; P-II relatively long and P-IV of nearly uniform height along entire length; two thickened setae at tip of P-V and two smaller thickened setae placed more proximally; figure 510 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $69\mu m$ -73 μm (greatest height of this segment $34\mu \text{m} - 35\mu \text{m}$; I-Leg-5, $142\mu \text{m} - 158\mu \text{m}$; I-Leg-6, $78\mu \text{m} - 86\mu \text{m}$; figure 513 illustrates these segments.

Material Examined: NORTH ISLAND: 1 of, 1 and Rotoaria Rd, June 5, 1981; 1 of, 1 and Rotoaria Rd, June 5, 1981; 1 of, 1 and Rotoaria Rd, June 5, 1981; 1 of, 1 and Rotoaria Rd, June 5, 1981; 1 of, stream 1 km north of Tohere (east of Opotiki on Rt 35), Oct. 29, 1982; 1 and Owhiritoa Bridge, on Rt 2 in 'Gorge' south of Opotiki, Oct. 29, 1982; 1 of, Makakomiko Stream on Rt 2, in 'Gorge' south of Opotiki, Oct. 29, 1982; 1 of, Makakomiko Stream on Rt 4 (1 km south of Erua), between Erua and National Park, Nov. 2, 1982; SOUTH ISLAND: 1 and Tributary of Whangamoa River slightly west of Rai Saddle (at Col-

lins Valley Picnic Grounds), Nov. 6, 1982; 1, tribulary of Motupiko River, on Rt 6 between Korere and Glenhope, 1982.

Discussion: The combination of a proportionally long P-IV of relatively uniform height (fig. 510) and a I-Leg-6 with the dorsal projection more or less above insertion of the segment (with the pointed extensions of this projection relatively far apart) are diagnostic for the present species.

84. Neomomonia hopkinsi, new species

(Figs. 511, 512, 514, 515)

Female: Integumental pigment absent, eye pigment developed; dorsal shield $441\mu \text{m}$ in length, $324\mu \text{m}$ in width; dorsal shield divided into a smaller anterior plate and a much larger posterior plate; anterior plate 133 \mu m in length, 285 \mu m in width; posterior plate bearing three pairs of glandularia and is closely flanked by five pairs of glandularia sclerites (fig. 512); ventral shield $471\mu m$ (592 μm) in length, $365\mu m$ ($456\mu m$) in width; anterior coxae projecting beyond body, these with a ridge extending part way posteriorly from tips; suture line between third and fourth coxae abruptly angled near insertions of fourth legs; projections associated with insertions of fourth legs well developed; a patch of 4-5 (6-7) setae on each side posterior to insertions of fourth legs, these tend to be shorter than in other members of the genus; clear area in integument (so obvious in other members of the genus) reduced nearly to the point of being absent; three pairs of genital acetabula, these located on small sclerites and arranged nearly in a straight line which extends posterolaterally; postgenital sclerite fused with an arc-like sclerite which bears the excretory pore and a pair of glandularia; figure 511 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $15\mu m$ (20 μm); P-II, $40\mu m$ (48 μm); P-III, $22\mu m$ (29 μm); P-IV, $45\mu m$ $(56\mu m)$; P-V, $31\mu m$ $(39\mu m)$; P-IV noticeably expanded distally (it would appear as in figure 519 if the segment were not rotated in the specimen illustrated); two thickened setae at tip of P-V and two smaller thickened setae placed more proximally; figure 514 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $62\mu m$ ($76\mu m$); greatest height of this segment $35\mu m$ ($40\mu m$); I-Leg-5, $128\mu m$ ($159\mu m$); I-Leg-6, $65\mu m$ ($79\mu m$); dorsal projection at proximal end of I-Leg-6 placed nearly directly above origin of segment; the two pointed extensions on the dorsal projection relatively close together; subapical lobe of claw placed rather close to tip; figure 515 shows the proportions and chaetotaxy of these segments.

Male: Unknown.

Holotype: Adult \(\frac{1}{2} \), from a tributary of the Waiwawa River at AA Rest Stop, 3 km west of Coroglen (Coromandel Peninsula), North Island, Oct. 27, 1982.

Paratype: 1 \(\frac{1}{2} \), headwaters of Whangamata Stream, 10 km northwest of Taupo, North Island, Nov. 3, 1982.

Discussion: The combination of abruptly angled suture lines between third and fourth coxae, dorsal projection on I-Leg-6 located directly above insertion (and with the two extensions close together), and noticeably expanded ventral side of P-IV, are diagnostic for the present species. The paratype specimen is noticeably larger but otherwise agrees well with the holotype. Unfortunately, the dorsal shield of the paratype was lost during slide making and so comparisons of this structure were not possible. There is, therefore, the possibility that the two specimens actually belong to separate species.

85. Neomomonia benova, new species

(Figs. 516-520)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 513 μm (494 μm -502 μm) in length, 388 μm (358 μm -373 μm) in width; dorsal shield divided into a smaller anterior plate and a much larger posterior plate; anterior plate $133\mu \text{m}$ ($135\mu \text{m}$ - $140\mu \text{m}$) in length, $318\mu \text{m}$ ($289\mu \text{m}$ - $303\mu \text{m}$) in width; posterior plate bearing three pairs of glandularia and closely flanked by five pairs of glandularia sclerites; dorsal shield as shown for female; ventral shield $564\mu m$ (540) μ m-570 μ m) in length, 418 μ m (395 μ m-403 μ m) in width; anterior coxae projecting beyond body; suture lines between third and fourth coxae extending anterolaterally more or less in an arc; projections associated with insertions of fourth legs well developed; a patch of six to eight long setae on each side posterior to insertions of fourth legs; a clear area in the integument on each side immediately lateral to these setal patches; gonopore $81\mu m$ in length and noticeably narrowed to a point posteriorly (fig. 518); three pairs of genital acetabula, these nearly touching in the midline; excretory pore terminal; dorsal lengths of the palpal segments: P-I, $15\mu m$ ($14\mu m$ - $15\mu m$); P-II, $50\mu m$ ($45\mu m$ - $48\mu m$); P-III, $31\mu m$ ($29\mu m$ - $33\mu m$); P-IV, $55\mu m$ ($48\mu m$ - $52\mu m$); P-V, $34\mu m$ ($31\mu m$ - $34\mu m$); structure of palp as described and illustrated for female; dorsal lengths of the distal segments of the first leg: I-Leg-4, $69\mu m$ ($62\mu m$ - $66\mu m$); greatest height of this segment, 35 μm (31 μm -35 μm ; I-Leg-5, 159 μm (152 μm -159 μm); I-Leg-6, 111 μm (107 μm -109) μ m); dorsal projection at proximal end of I-Leg-6 extending well proximal to the origin of the segment; the two pointed extensions of this dorsal projection relatively far apart; subapical lobe of claw placed rather far proximally to tip; the morphology of the first leg as illustrated for the female.

Female: Dorsal shield as described for male; dorsal shield $532\mu m$ ($532\mu m$ - $547\mu m$) in length, $380\mu m$ ($386\mu m-402\mu m$) in width; anterior plate of dorsal shield $140\mu m$ ($137\mu m$ - $140\mu m$) in length, $314\mu m$ ($318\mu m$ - $333\mu m$) in width; ventral shield $581\mu m$ ($577\mu m$ - $581\mu m$) in length, $434\mu m$ ($440\mu m$ - $446\mu m$) in width; except for genital field region, ventral shield as described for male; posterior margins of fourth coxae much farther from genital field than in male; three pairs of genital acetabula, these located on small sclerites and arranged in outwardly directed arcs; postgenital sclerite fused with a broad arc-like sclerite which also bears the excretory pore and a pair of glandularia (fig. 517); dorsal lengths of the palpal segments: P-I, $15\mu m$ ($15\mu m$ - $17\mu m$); P-II, $50\mu m$ ($49\mu m$ - $50\mu m$); P-III, $31\mu \text{m}$ (29 μm -31 μm); P-IV, $58\mu \text{m}$ (52 μm -55 μm); P-V, $38\mu \text{m}$ (35 μm -37 μm); P-IV noticeably expanded in distal half; two thickened setae at tip of P-V and two smaller thickened setae placed more proximally; figure 519 shows the proportions and chaetataxy of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $66\mu m$ ($64\mu m$ - $69\mu m$); greatest height of this segment $37\mu m$ ($35\mu m$ - $38\mu \text{m}$); I-Leg-5, $166\mu \text{m}$ ($156\mu \text{m}$ - $162\mu \text{m}$); I-Leg-6, $110\mu \text{m}$ ($108\mu \text{m}$ - $114\mu \text{m}$); these segments as described for male (fig. 516).

Holotype: Adult of, from a stream 1 km north of Tohere (east of Opotiki),

North Island, Oct. 29, 1982.

Allotype: Adult \(\begin{aligned} \text{, same data as holotype.} \end{aligned} \)

Paratypes: NORTH ISLAND: 1 of, 1 \(\text{?}, \) stream on Wainui Rd, 5 km west of Mahinepua Rd, northern North Island, Oct. 22, 1982; 1 \(\text{?}, \) stream at Owhiritoa Bridge on Rt 2, in ''Gorge'' south of Opotiki, Oct. 29, 1982; SOUTH ISLAND: 3 of, tributary of Whangamoa River on Rt 6, slightly west of Rai Saddle (at Collins Valley Picnic Grounds), Nov. 6, 1982; 1 of, small creek on Rt 6, approx 10

km west of Havelock, Nov. 22, 1982; 1, tributary of Whangamoa River on Rt 6, just west of Rai Saddle (at Collins Valley Picnic Grounds), Nov. 22, 1982; 1, Whangamoa River on Rt 6, approx 5 km northeast of Whangamoa Saddle, Nov. 23, 1982.

<u>Discussion</u>: The present species seems most closely related to the following species. See remarks under the latter for characters which will distinguish the two. The present species differs from the two previously described species in having the dorsal projection on I-Leg-6 extending well proximal to insertion of the segment and in having the clear area lateral to the setal patch of the ventral shield much larger.

86. Neomomonia paramecia, new species

(Figs. 521-524, 526)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 456 μ m (426 μ m-441 μ m) in length, 288 μ m (251 μ m-315 μ m) in width; dorsal shield divided into a smaller anterior plate and a much larger posterior plate; anterior plate $133\mu\mathrm{m}$ ($111\mu\mathrm{m}$ - $126\mu\mathrm{m}$) in length, $251\mu\mathrm{m}$ ($215\mu\mathrm{m}$ - $266\mu\mathrm{m}$) in width; posterior plate with three pairs of glandularia and closely flanked by five pairs of glandularia sclerites; figure 521 shows the structure of the dorsal shield; ventral shield $517 \mu \text{m} \ (456 \mu \text{m} - 492 \mu \text{m})$ in length, $319 \mu \text{m} \ (285 \mu \text{m} - 364 \mu \text{m})$ in width; anterior coxae projecting beyond body; suture lines between third and fourth coxae extending anterolaterally more or less in an arc; projections associated with insertions of fourth legs well developed; a patch of seven to eight long setae on each side posterior to insertions of fourth legs; a distinct clear area on each side immediately lateral to the setal patches; gonopore $92\mu m$ ($77\mu m-89\mu m$) in length, and is relatively wide and rounded posteriorly (fig. 523); three pairs of genital acetabula, these nearly touching medially; excretory pore terminal; dorsal lengths of the palpal segments: P-I, $13\mu m$ ($13\mu m-14\mu m$); P-II, $40\mu m$ ($39\mu m-41\mu m$); P-III, $24\mu \text{m}$ (25 μm -26 μm); P-IV, 43 μm (41 μm -45 μm); P-V, 30 μm (29 μm -31 μm); P-IV noticeably expanded distally; two thickened setae at tip of P-V and two smaller thickened setae placed more proximally; figure 522 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $55\mu m$ ($55\mu m$ - $59\mu m$); greatest height of this segment, $31\mu m$ ($29\mu m$ -31 μ m); I-Leg-5, 145 μ m (128 μ m-140 μ m); I-Leg-6, 116 μ m (111 μ m-124 μ m); dorsal projection on proximal portion of I-Leg-6 extending well proximal to origin of this segment; the two pointed extensions on this dorsal projection relatively far apart; subapical lobe of claw placed rather far proximal to tip; figure 524 shows the proportions and chaetotaxy of these segments.

Female: Dorsal shield as described for male; dorsal shield $426\mu m$ ($395\mu m$ - $440\mu m$) in length, $247\mu m$ ($239\mu m$ - $327\mu m$) in width; anterior plate of dorsal shield $118\mu m$ ($111\mu m$ - $118\mu m$) in length, $217\mu m$ ($199\mu m$ - $273\mu m$) in width; ventral shield $460\mu m$ ($436\mu m$ - $486\mu m$) in length, $282\mu m$ ($274\mu m$ - $360\mu m$) in width; except for genital field region, ventral shield as described for male; posterior margins of fourth coxae much farther from the genital field than in the male; three pairs of genital acetabula, these located on small sclerites and arranged in an outwardly directed arc; postgenital sclerite fused with a broad arc-like sclerite which bears the excretory pore and a pair of glandularia (fig. 526); dorsal lengths of the palpal segments: P-I, $13\mu m$ ($12\mu m$ - $14\mu m$); P-II, $37\mu m$ ($35\mu m$ - $41\mu m$); P-III, $24\mu m$ ($24\mu m$ - $26\mu m$); P-IV, $41\mu m$ ($38\mu m$ - $44\mu m$); P-V, $27\mu m$ ($27\mu m$ - $30\mu m$); structure of palp as described and illustrated for male; dorsal lengths of the distal seg-

ments of the first leg: I-Leg-4, $54\mu m$ ($55\mu m$ - $57\mu m$); greatest height of this segment $29\mu m$ ($30\mu m$ - $32\mu m$); I-Leg-5, $128\mu m$ ($131\mu m$ - $145\mu m$); I-Leg-6, $110\mu m$ ($106\mu m$ - $117\mu m$); these segments as shown and described for male.

Holotype: Adult of, Four Mile River on Rt 6, between Charleston and Tiro-

noana, South Island, Nov. 8, 1982.

Allotype: Adult 9, same data as holotype.

Paratypes: NORTH ISLAND: 1 \(\frac{1}{2} \), stream at Owhiritoa Bridge on Rt 2, in the "Gorge" south of Opotiki, Oct. 29, 1982; 1 \(\sigma \), 2 \(\frac{1}{2} \), stream at Opato Bridge area (at rest stop), on Rt 2 south of Opotiki, Oct. 29, 1982; 1 \(\frac{1}{2} \), Mangatokiiti Stream (Egmont area) on Opunake Rd, 10 km west of Stratford, Nov. 1, 1982; SOUTH ISLAND: 10 \(\sigma \), 2 \(\frac{1}{2} \), tributary of Wakamarina River, 7 km southeast of Canvastwon (off Rt 6), Nov. 5, 1982; 1 \(\sigma \), Opouri River between Carluke and Opouri Valley on Tennyson Inlet Rd, Nov. 6, 1982; 3 \(\sigma \), same data as holotype; 1 \(\frac{1}{2} \), Potters Creek on Rt 6, between Bruce Bay and Lake Paringa (north of Haast), Nov. 10, 1982; 1 \(\frac{1}{2} \), Rocky Gully Stream on Rt 8, between Cave and Fairlie (west of Timaru), Nov. 18, 1982; 1 \(\sigma \), Graham Stream on Rt 6, at picnic grounds 8 km northeast of Whangamoa Saddle, Nov. 23, 1982; 3 \(\sigma \), Whangamoa River on Rt 6, approx 5 km northeast of Whangamoa Saddle, Nov. 23, 1982; 1 \(\sigma \), 3 \(\frac{1}{2} \), Wakapuaka River on Rt 6, on western edge of Hira State Forest, Nov. 23, 1982.

Discussion: The present species is most closely related to the previous species, \overline{N} . \overline{benova} , but differs in being smaller and typically proportionally much narrower. Actually, most specimens are as narrow as, or are narrower than, indicated in figures 523 and 526. It is a single male and female specimen from an unnamed stream on Wianui Road, 5 km west of Mahinepua Road (in northern North Island) which are relatively wide (but otherwise agree with the characters of the present species) which produce the large width measurements in the paratype series. The male gonopore is rounded posteriorly in the present species and I-Leg-6 is much longer relative to I-Leg-5 in both sexes than in any other member of the genus.

Genus PARTIDOMOMONIA, new genus

Discussion: (Based on male, female unknown); characters of the family Momoniidae as given by Cook (1974); dorsal shield consisting of a series of closely fitting sclerites which are better illustrated (fig. 527) than described; gland portion missing on many of the dorsal glandularia; ventral shield entire; all coxae fused with the ventral shield; three pairs of genital acetabula, these lying free and widely separated medially in the oval male gonopore (fig. 529); male genital field incorporated into the ventral shield; setae posterolateral to openings for insertion of fourth legs short and few in number; I-Leg-6 with the dorsal projection elongated and extending 180° from distal portion (fig. 528); P-V with one terminal seta much longer than others.

Type Species: Partidomomonia polyplacophora, new species.

Discussion: The new genus likely belongs in the subfamily Momoniinae, but a knowledge of the female is necessary before this can be stated with certainty. It is a bit difficult to homologize the glandularia of the dorsal shield with those of Neomomonia. However, it appears the small anteromedial and following paired plates bearing the postocularia correspond to the anterior plate, and the larger paired plates plus the posteromedial plate correspond to the posterior plate of Neomomonia. It is likely that the lateral platelets bearing setae (homologs of glandularia) lateral to the postocularia platelets correspond to the glandularia opposite the suture line between anterior and posterior plates of the pre-

vious genus. The setae on the large paired plates and two pairs of setae on the posteromedial plate correspond to the glandularia on the posterior plate of *Neomomonia*. However, there are only three pairs of glandularia (or their homologs) lateral to these large plates and there should be four pairs in order to homologize exactly with the condition found in the previous genus. If positions of the glandularia are relatively constant in the two genera, it is the second from the last pair of free glandularia in *Neomomonia* that are missing in *Partidomomonia*.

A nymphal specimen of what is without doubt a second species of the presant genus was taken from interstitial waters of a stream in Queensland, Australia.

87. Partidomomonia polyplacophora, new species

(Figs. 525, 527-529, 531)

Male: Integumental pigment absent, eye pigment greatly reduced; all body sclerites thin; dorsal shield $684\mu m$ in length, $502\mu m$ in width; dorsal shield consisting of numerous closely fitting sclerites which are better illustrated (fig. 527) than described; the presumed homologies of the glandularia and sclerites are discussed in the generic description; ventral shield 798 µm in length, 523 µm in width; anterior coxae projecting beyond body proper; projections associated with insertions of fourth legs well developed; three or four short setae on each fourth coxa posterior to insertions of fourth legs; no clear areas lateral to these setae; gonopore $81\mu m$ in length, $89\mu m$ in width; three pairs of genital acetabula, these lateral in position; gonopore closely flanked by 10-11 setae (or setal bases) on each side (fig. 529); excretory pore subterminal; figure 531 illustrates the ventral shield; dorsal lengths of the palpal segments: P-I, $22\mu m$; P-II, $53\mu m$; P-III, $38\mu \text{m}$; P-IV, $72\mu \text{m}$; P-V, $51\mu \text{m}$; only one of the ventral setae on P-IV greatly thickened; only one of the end setae of P-V greatly enlarged; P-V bearing three smaller, thickened setae (fig. 525); dorsal lengths of the distal segments of the first leg: I-Leg-4, $100\mu m$; I-Leg-5, $248\mu m$; I-Leg-6, $259\mu m$; dorsal projection on proximal portion of I-Leg-6 greatly lengthened and extending at an angle of 180° from the distal portion of the segment; claw $148\mu\mathrm{m}$ in length; structure of these segments of the first leg better illustrated (fig. 528) than described.

Female: Unknown.

Holotype: Adult of, from a stream on Wainui Rd, 5 km west of Mahinepua Rd, northern North Island, Oct. 22, 1982.

Genus MOMONIELLA Viets

88. Momoniella sp.

(Figs. 530, 532, 533)

Newly Metamorphosed Nymph: dorsum too unsclerotized to describe, although "pores" are forming over an extensive area and it is obvious there will be a dorsal shield; ventral shield $608\mu m$ in length, $577\mu m$ in width; anterior coxae projecting, forming a camerostome with a somewhat concave anterior edge; tips of first coxae curving into a semicircular anterior rim; capitular bay relatively wide $(74\mu m)$; provisional genital field consisting of two pairs of close-

ly spaced acetabula; figure 532 illustrates the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $19\mu m$; P-II, $54\mu m$; P-III, $38\mu m$; P-IV, $56\mu m$; P-V, $44\mu m$; ventral setae of P-IV consisting of one greatly thickened seta and one only slightly thickened seta; tip of P-V with one extremely large seta and a much smaller (but thickened) seta; figure 533 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $76\mu m$; I-Leg-5, $176\mu m$; I-Leg-6, $104\mu m$; figure 530 shows the structure of these segments.

Adults: Unknown.

Material Examined: 1 nymph, Whangamoa River on Rt 6, approx. 5 km northeast of the Whangamoa Saddle, South Island, Nov. 23, 1982.

<u>Discussion</u>: This single nymph from New Zealand is very similar to the nymph of one of the undescribed Australian members of the genus, and is characterized by a greatly enlarged terminal seta on P-V (fig. 533). As was discussed for the single nymph of *Oxus* taken (page 18), the present specimen may be in New Zealand as the result of chance dispersion rather than as part of an established population. Unfortunately, only further collecting in New Zealand will provide the answer. Members of this genus have been collected in West Africa, Indonesia, Australia and New Zealand, with species from the latter two areas belonging to a distinctive species group in which the tips of the anterior coxae are curved into semicircles (fig. 532).

Family MIDEOPSIDAE Koenike

Genus NUDOMIDEOPSIS Szalay

89. Nudomideopsis forkensis (Imamura)

(Figs. 534-537)

Mideopsis forkensis Imamura, 1977. Jour. Speleol. Soc. Japan, 2: 11.

Male: Dorsal shield $653\mu m$ in length, $532\mu m$ in width; dorsal shield darkly pigmented except for the central area; dorsal shield oval, the arrangement of the postocularia and glandularia better illustrated (fig. 535) than described; ventral shield $669\mu m$ in length, $562\mu m$ in width; gonopore foreshortened in ventral view; three pairs of acetabula; a short ridge on each side extending anterolaterally from region of the third coxae; epimeroglandularia 2 placed posterior to the fourth coxae; a pair of glandularia on the lateral borders of fourth coxae; epimeroglandularia l shifted anteriorly to suture line of first coxae; figure 537 shows the morphology of the ventral shield; dorsal lengths of the palpal segments: P-I, $20\mu \text{m}$; P-II, $48\mu \text{m}$; P-III, $43\mu \text{m}$; P-IV, $111\mu \text{m}$; P-V, $34\mu \text{m}$; P-IV simple, without a ventral tubercle; the small ventral seta of P-IV is much more proximal in location on the palp not illustrated; figure 536 shows the structure of the palp; capitulum 93µm in length; chelicera 110µm in length; dorsal lengths of the distal segments of the first leg: I-Leg-4, $46\mu m$; I-Leg-5, $79\mu m$; I-Leg-6, $98\mu m$; figure 534 illustrates these segments; segments 2 and 3 of first three pairs of legs with long ventral setae but no true swimming hairs; IV-Leg-5 with one long seta which can be considered a swimming hair.

Female: See Imamura (1977).

Material Examined: 1 of, Waikohatu Stream on Rt 12, in Waipoua State Forest, northern North Island, May 29, 1981.

Discussion: Although the present male specimen is somewhat larger than

Imamura's female mite (and typically males of a species are smaller than the females), it agrees with the latter in general morphology. Until additional material is collected and species placement possibly proven wrong, they are considered conspecific. I am following Ian Smith's suggestion that *Nudomideopsis* be given full generic rank. The occurrence of the genus in New Zealand is an amazing bit of disjunct distribution. All other members are confined to the holarctic region, with the bulk of the species endemic to Japan.

Family UCHIDASTYGACARIDAE Imamura
Subfamily MORIMOTACARINAE Imamura
Genus AUSTRAMIDEOPSOIDES, new genus

The new genus appears to belong to the Morimotacarinae but necessitates revising the subfamily diagnosis as given by Cook (1974) as follows: Characters of the family Uchidastygacaridae; a well developed genital bay present; genital field either flanked by a pair of glandularia (epimeroglandularia 2) or these are placed anterolateral to the genital field; palp not rotated; P-IV may or may not be expanded but lacks a thickened ventral seta; claws present on fourth leg.

Generic Diagnosis: Characters of the subfamily Morimotacarinae; only the first coxae sharp-pointed; outer margins of second and third coxae only slightly extending in area of coxal tips; openings for insertion of fourth legs relatively close together and with no projections; IV-Leg-I long, much longer than IV-Leg-6; posterior pairs of genital acetabula in male partially covered by fixed sclerites flanking the gonopore; anterior two pairs of acetabula well separated from the posterior pair (fig. 541); palp five segmented, with a hyaline ventral projection on P-II (and P-III in the New Zealand species).

Type Species: Austramideopsoides serratipalpis, new species.

Discussion: Two species belonging to this genus are known from New Zealand and a third (undescribed) species, lacking the lateral projections on the dorsal shield, has been collected in Tasmania. The present new genus, plus an additional new genus from Australia, exhibit character states which indicate a closer relationship between the Mideopsidae and Uchidastygacaridae (and the latter's subfamily Morimotacarinae) than was previously suspected. These relationships will be discussed in a paper dealing with the Australian water mites.

90. Austramideopsoides serratipalpis, new species

(Figs. 538-543, 548, 549)

Male: Integumental pigment absent, eye pigment reduced; dorsal shield 320 μ m in length, 248 μ m in width; dorsal shield oval and with a pair of lateral ridges; three pairs of glandularia on the dorsal shield; postocularia lying somewhat medial to first pair of glandularia; structure of dorsal shield as shown for the female; ventral shield 381 μ m in length, 277 μ m in width; first coxae projecting beyond body and with a dorsal hood forming a camerostome; tips of second and third coxae rounded; suture lines of fourth coxae Y-shaped; openings for insertion of fourth legs relatively close together medially and without associated projections; posterior suture lines of fourth coxae lightly indicated; lateral edges of ventral shield with sharp-pointed projections (fig. 539); epimeroglandularia 2 placed in a line with the anterior end of gonopore; genital field with three pairs

of acetabula, these arranged in two closely set anterior pairs which are well removed from posterior acetabula; medial edges of gonopore sclerites extending towards midline posterior to anterior groups of acetabula and partially covering the posterior acetabula (fig. 541); genital field flanked by six pairs of setae; the gonopore $45\,\mu\mathrm{m}$ in length; dorsal lengths of the palpal segments: P-I, $10\,\mu\mathrm{m}$; P-II, $38\,\mu\mathrm{m}$; P-III, $19\,\mu\mathrm{m}$; P-IV, $31\,\mu\mathrm{m}$; P-V, $15\,\mu\mathrm{m}$; structure of palp as illustrated and described for female; capitulum $90\,\mu\mathrm{m}$ in length; chelicera $87\,\mu\mathrm{m}$ in length; capitulum with a relatively long rostrum as in the female; dorsal lengths of the distal segments of the first leg: I-Leg-4, $41\,\mu\mathrm{m}$; I-Leg-5, $52\,\mu\mathrm{m}$; I-Leg-6, $73\,\mu\mathrm{m}$; first leg as in female; first segment of fourth leg longer than the sixth segment;

swimming hairs absent.

Female: Dorsum as described for male; dorsal shield $344\mu m$ in length, $266\mu m$ in width; ventral shield $407\mu m$ in length, $296\mu m$ in width; except for genital field region, female ventral shield as described for male; capitular bay $34\mu m$ in width; genital field with three pairs of acetabula lying on the ventral shield; three or four setae on each side of acetabula (fig. 543); gonopore approximately as wide as long, $38\mu m$ in width; dorsal lengths of the palpal segments: P-I, 19 μm ; P-II, $37\mu m$; P-III, $21\mu m$; P-IV, $33\mu m$; P-V, $16\mu m$; both P-II and P-III with hyaline ventral projections of moderate length; ventral seta of P-IV hair-like and located in proximal portion of segment; ventral edge distal to seta appearing serrate; P-IV gradually tapering distally; figure 548 shows the proportions and chaetotaxy of the palp; capitulum $96\mu m$ in length; chelicera $98\mu m$ in length; figure 559 shows the prominent rostrum characteristic of this species; dorsal lengths of the distal segments of the first leg: I-Leg-4, $41\mu m$; I-Leg-5, $51\mu m$; I-Leg-6, $76\mu m$; figure 540 illustrates these segments; swimming hairs absent.

Holotype: Adult of, from a tributary of the Wakamarina River, 7 km southeast

of Canvastown (off Rt 6), South Island, Nov. 5, 1982.

Allotype: Adult \(\varphi \), headwaters of Whangamata Stream, 10 km northwest of

Taupo, North Island, Nov. 3, 1982.

Discussion: See remarks under the following species for characters which will separate the known members of the genus.

91. Austramideopsoides ramsayi, new species

(Figs. 544-547, 550)

Female: Integumental pigment absent, eye pigment reduced; dorsal shield $300\mu m$ (277 μm -311 μm) in length, $207\mu m$ (192 μm -233 μm) in width; dorsal shield oval, with a pair of lateral ridges; three pairs of glandularia on dorsal shield; postocularia placed anteromedial to the first pair of glandularia; figure 550 shows a dorsal view of the mite; ventral shield $340\mu m$ ($333\mu m$ - $355\mu m$) in length, $241\mu m$ $(222\mu m-251\mu m)$ in width; first coxae projecting beyond body and with a dorsal hood forming a camerostome; capitular bay 24μ m in width; tips of second and third coxae rounded; suture lines not distinct as in previous species; openings for insertion of fourth legs relatively close together medially and without associated projections; posterior suture lines of fourth coxae indistinct; epimeroglandularia 2 placed near these suture lines well anterior to genital field; pointed projections on lateral edges of ventral shield; genital field with three pairs of acetabula lying on the ventral shield; three or four setae on each side associated with acetabulal region; gonopore small and somewhat longer than wide (27 µm in width); figure 546 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $9\mu m$ ($8\mu m$ - $11\mu m$); P-II, $26\mu m$ ($25\mu m$ - $28\mu m$); P-III, $15\mu m$

 $(15\mu\text{m-}18\mu\text{m})$; P-IV, $22\mu\text{m}$ ($21\mu\text{m-}27\mu\text{m}$); P-V, $12\mu\text{m}$ ($11\mu\text{m-}14\mu\text{m}$); hyaline projection on ventral side of P-II and P-III relatively long; ventral seta on P-IV hair-like and located near distal end of segment; P-IV actually expanded towards distal end; figure 545 shows the proportions and chaetotaxy of the palp; capitulum $64\mu\text{m}$ ($62\mu\text{m-}72\mu\text{m}$) in length; chelicera $65\mu\text{m}$ ($62\mu\text{m-}72\mu\text{m}$) in length; rostrum much shorter than in previous species (fig. 547); dorsal lengths of the distal segments of the first leg: I-Leg-4, $38\mu\text{m}$ ($36\mu\text{m-}39\mu\text{m}$); I-Leg-5, $45\mu\text{m}$ ($43\mu\text{m-}45\mu\text{m}$); I-Leg-6, $69\mu\text{m}$ ($66\mu\text{m-}69\mu\text{m}$); figure 544 illustrates these segments; swimming hairs absent.

Male: Not known with certainty. A male, lacking mouthparts but with the narrow body and narrow capitular bay found in females of the present species, was collected in Potters Creek on Rt 6, between Bruce Bay and Lake Paringa (north of Haast), South Island. I hesitate to assign it to the present species when the more important taxonomic characters exhibited by the palp are not available. If it is the male of ramsayi, the ventral shield is similar to that of the related species.

Holotype: Adult \(\text{\text{\$\general}} \), headwaters of Whangamata Stream, 10 km northeast of of Taupo, North Island, Nov. 3, 1982.

Paratypes: NORTH ISLAND: 3 \(\), same data as holotype; SOUTH ISLAND: 1 \(\), Whale Creek on Rt 6, west of Murchison, Nov. 7, 1982; 1 \(\), Four Mile River on Rt 6, between Charleston and Tiromoana, Nov. 8, 1982; 1 \(\), Adamson Creek on Rt 6, between Lake Ianthe and Whanganui, Nov. 9, 1982; 1 \(\), MacLennan River at bridge on Aurora Creek Rd (Catlins State Forest area) between Puketiro and Rt 92, Nov. 12, 1982.

<u>Discussion</u>: Presently, three species of *Austramideopsoides* are known. An undescribed species from Tasmania differs in several characters but the most obvious is a lack of projections on the sides of the ventral shield, a character found in both New Zealand species.

As for characteristics separating the two New Zealand species, *N. ramsayi* and *N. serratipalpis*, differences in the mouthparts are most useful. Compare figures 545 and 548 for the differences in palps, and figures 547 and 549 for the differences in length of the rostrum. The females of the present species also have a proportionally narrower capitular bay and gonopore.

Family ARRENURIDAE Thor

Genus ARRENURUS Duges

92. Arrenurus zelandicus, new species

(Figs. 551, 552, 555, 556)

<u>Female</u>: Integumental pigment absent, eye pigment developed; dorsal shield $745\,\mu\mathrm{m}$ ($714\,\mu\mathrm{m}$) in length, $441\,\mu\mathrm{m}$ ($449\,\mu\mathrm{m}$) in width; dorsal shield bearing the postocularia and three pairs of glandularia; no dorsal tubercles on dorsal shield; body pores very small, with two to six pores sharing a common subcuticular opening; figure 555 shows a dorsal view; ventral shield $820\,\mu\mathrm{m}$ ($791\,\mu\mathrm{m}$) in length, $510\,\mu\mathrm{m}$ ($501\,\mu\mathrm{m}$) in width; body oval, without projections or humps; anterior coxae projecting beyond body; a few body pores present between the second and third coxae, and medially between the third and fourth coxae; acetabular plates $364\,\mu\mathrm{m}$ ($380\,\mu\mathrm{m}$) in width; gonopore $127\,\mu\mathrm{m}$ ($125\,\mu\mathrm{m}$) in length, $137\,\mu\mathrm{m}$ ($133\,\mu\mathrm{m}$) in width; four pairs of long setae on lateral margins of fourth coxae; figure 556 shows the

structure of the ventral shield; dorsal lengths of the palpal segments: P-I, $24\mu m$ ($22\mu m$); P-II, $59\mu m$ ($55\mu m$); P-III, $52\mu m$ ($48\mu m$); P-IV, $65\mu m$ ($63\mu m$); P-V, $42\mu m$ ($41\mu m$); figure 551 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, $111\mu m$ ($110\mu m$); I-Leg-5, $110\mu m$ ($114\mu m$); I-Leg-6, $128\mu m$ ($136\mu m$); figure 552 shows these segments; IV-Leg-3 with three swimming hairs, IV-Leg-4 with two or three swimming hairs, IV-Leg-5 with four to six swimming hairs.

Male: Unknown.

Holotype: Adult 9, Kaituna River on Rt 6, 5 km south of Havelock, northern South Island, Nov. 22, 1982.

Paratype: 1 \, same data as holotype.

Discussion: Until the male of this interstitial species is known, its affinities will remain uncertain, but it does show characteristics which are considered typical of *Truncaturus*.

93. Arrenurus (Arrenurus) stouti, new species

(Figs. 553, 554, 557-560)

Male: Integumental pigment present, eye pigment well developed; body, including petiole, $973\mu m$ ($927\mu m$ - $1003\mu m$) in length, $638\mu m$ ($623\mu m$ - $684\mu m$) in width; pygal lobes well developed and directed posteriorly; width between outer margins of pygal lobes $486\mu m$ ($479\mu m$ – $502\mu m$); dorsal shield $441\mu m$ ($445\mu m$ – $516\mu m$) in width; dorsal furrow passing onto sides of body; non-cauda portion of dorsal shield bearing two pairs of glandularia, the second pair associated with pointed dorsal humps; anterior end of body somewhat concave; a short, wide hyaline appendage present; petiole $155\mu\mathrm{m}$ ($151\mu\mathrm{m}$ - $155\mu\mathrm{m}$) in length, $104\mu\mathrm{m}$ (110 μ m-118 μ m) in width; petiole broadening posteriorly, with numerous, sharp spine-like integumental projections on ventral side; structure of petiole better illustrated (figs. 557, 559) than described; acetabular plates extending well up onto sides of body; dorsal lengths of the palpal segments: P-I, $34\mu m$ ($31\mu m$ -35 μ m); P-II, 69 μ m (69 μ m-76 μ m); P-III, 65 μ m (62 μ m-66 μ m); P-IV, 86 μ m (93 μ m-96 μ m); P-V, 48 μ m (50 μ m-52 μ m); palp similar to that illustrated for the female; dorsal lengths of the distal segments of the first leg: I-Leg-4, $162\mu m$ ($148\mu m$ - $164\mu \text{m}$); I-Leg-5, $155\mu \text{m}$ ($148\mu \text{m}$ - $157\mu \text{m}$); I-Leg-6, $222\mu \text{m}$ ($220\mu \text{m}$ - $244\mu \text{m}$); these leg segments proportionally longer than illustrated for the female and there are numerous short "swimming hairs" on I-Leg-6; IV-Leg-4 extending well beyond insertion of IV-Leg-5; swimming hairs present on second, third and fourth legs.

Female: Dorsal and ventral shields present, dorsal furrow complete; dorsal shield 577μ m (548μ m- 577μ m) in width; dorsal shield bearing the postocularia and three pairs of glandularia, third pair of glandularia on small bumps; body somewhat projecting anteriorly and concave between lateral eyes; lateral edges of body with two pairs of well developed humps; ventral shield 942μ m (898μ m- 988μ m) in length, 796μ m (790μ m- 836μ m) in width; acetabular plates 562μ m (547μ m- 578μ m) in width; genopore 133μ m (135μ m- 144μ m) in length, 130μ m (118μ m- 133μ m) in width; genital valves with pigmented areas as shown in figure 558; dorsal lengths of the palpal segments: P-I, 32μ m (31μ m- 34μ m); P-II, 74μ m (69μ m- 76μ m); P-III, 64μ m (62μ m- 66μ m); P-IV, 97μ m (87μ m- 95μ m); P-V, 50μ m (48μ m- 52μ m); figure 553 illustrates the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 148μ m (148μ m- 150μ m); I-Leg-5, 144μ m (137μ m- 141μ m); I-Leg-6, 177μ m (173μ m- 177μ m); figure 560 illustrates these segments; swimming hairs present on second, third and

fourth legs.

Holotype: Adult of, from Lake Ianthe, on Rt 6 between Pukekura and Evans Creek, South Island, Nov. 9, 1982.

Allotype: Adult \mathcal{P} , same data as holotype. Paratypes: 3 \mathcal{P} , same data as holotype.

Discussion: The present species is related to two members of the typical subgenus described by Stout (1953b). However, the much longer petiole and the more projecting pygal lobes in the male of the present species are diagnostic.

NEW ZEALAND HYPORHEIC WATER MITES

It was not possible to employ the classic Karaman-Chappuis method for collecting hyporheic (= interstitial) water mites in a majority of the New Zealand streams. Possibly as the result of a relatively constant rainfall throughout most of the year which keeps the streams from becoming low, and the fact there is a tendency for most of the streams to cut straight down rather than meander, the exposed bars of loose sand and gravel needed for efficient sampling by the Karaman-Chappuis method tend to remain under water. Collecting was done by digging deeply into the submerged bars with a shovel, spreading the gravel out in the more superficial waters and catching the organic material (and included organisms) several feet downstream. Digging to this depth (12"-18") probably does not sample the interstitial waters from as great a depth as when a hole is dug in a gravel bar and the water bailed out, but is sufficiently deep to take a large number of hyporheic forms. The main problem with this technique is that it, of course, stirs up and captures hydrachnids from the more superficial waters at the same time. Therefore, it is necessary to arbitrarily decide which species are interstitial. Those forms exhibiting loss of integumental pigmentation and reduction or complete loss of eye pigment, so characteristic of the hyporheic mites, almost certainly are from this habitat. However, it is known from studies on interstitial mites from other parts of the world in which collecting in exposed gravel bars is easier, that mites taken from the holes via the Karaman-Chappuis method often contain species in which integumental pigment and eye pigment are only slightly reduced. It is likely these species are in the process of adapting to the interstitial water environment. These intermediates present a problem in recognition when one collectes in the submerged gravel bars and it is certain the list of interstitial species given below omits a number of these borderline forms, for only those with obvious eye and integumental pigmentation loss are included. The number in parentheses following the species name is the one used for that species in the text.

NEW ZEALAND HYPORHEIC MITES: Euwandesia tenebrio (2); Limnesia birgelda (22); L. testacea (23); L. halcarda (24); L. crowelli (25); Notohygrobates kathrynae (30); Hopkinsobates suzannae (31); Aciculacarus amilis (34); Planaturus setipalpis (40); P. lundbladi (41); Taintaturus hopkinsi (42); T. accidens (43); T. abditus (44); T. projectus (45); Abelaturus cornophorus (46); Omegaturus longipalpis (47); Neotryssaturus pallidus (55); Pseudotryssaturus anchistus (57); P. planus (58); Evidaturus exilis (63); E. scopticus (64); Piotaturus alvecaudatus (65); P. bovalus (66); Paratryssaturus minutus (68); P. zodelus (69); Uralbia gracilipes (79); U. parva (80); U. projecta (81); Zelandalbia imamurai (82); Neomomonia torquipes (83); N. hopkinsi (84); N. benova (85); N. paramecia (86); Partidomomonia polyplacophora (87); Austramideopsoides serratipalpis (90); A. ramsayi (91); Arrenurus zelandicus (92).

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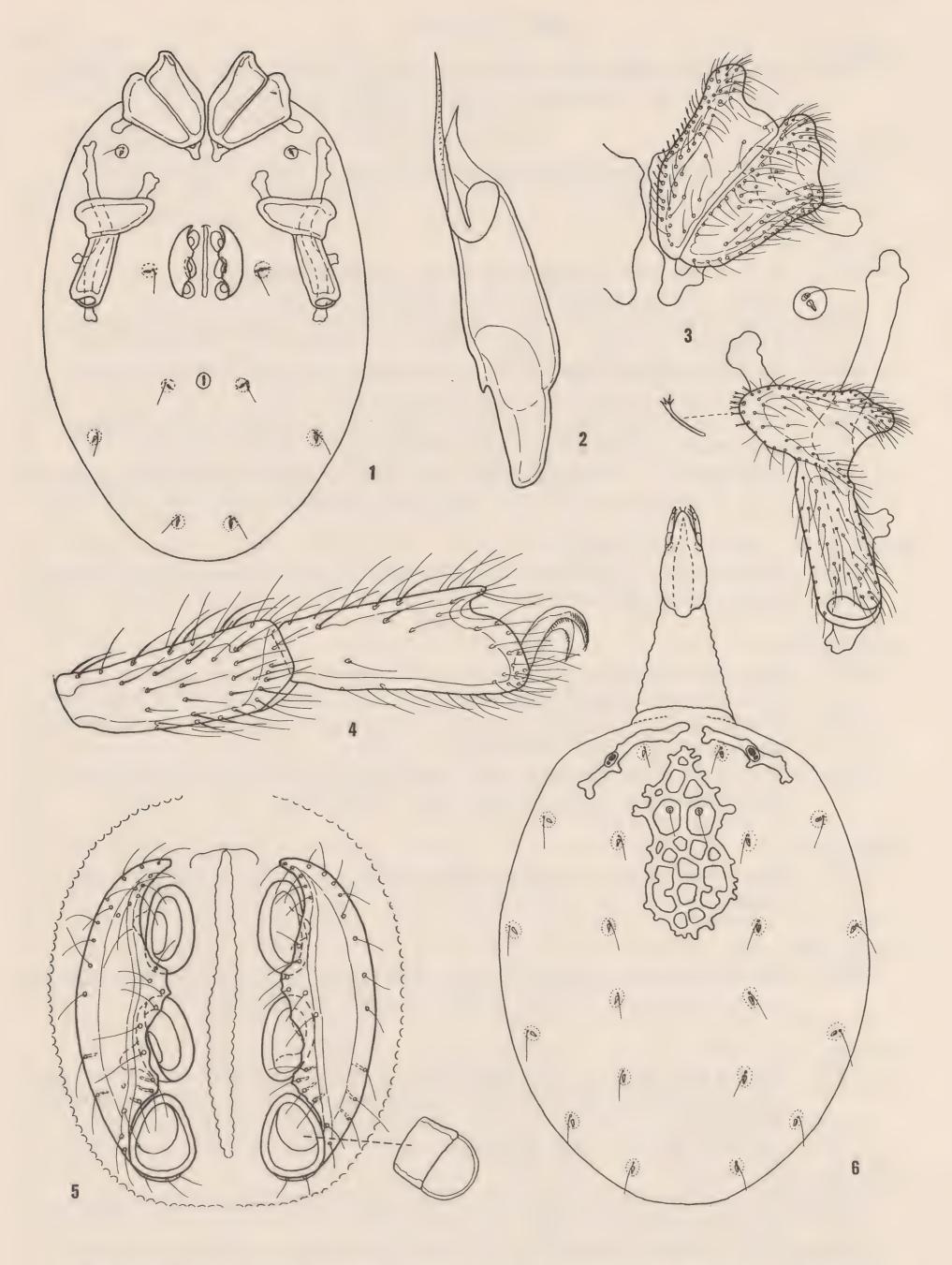
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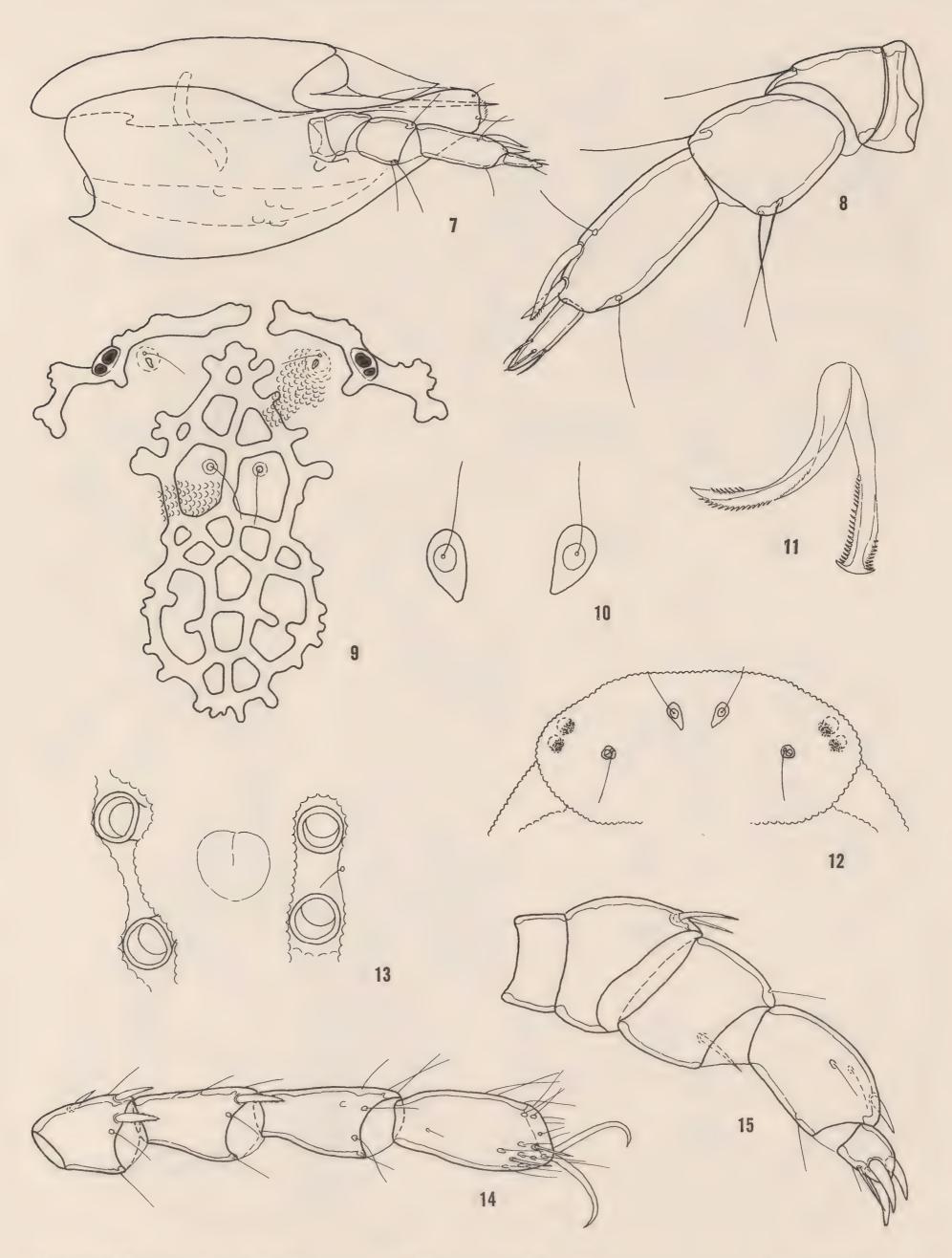
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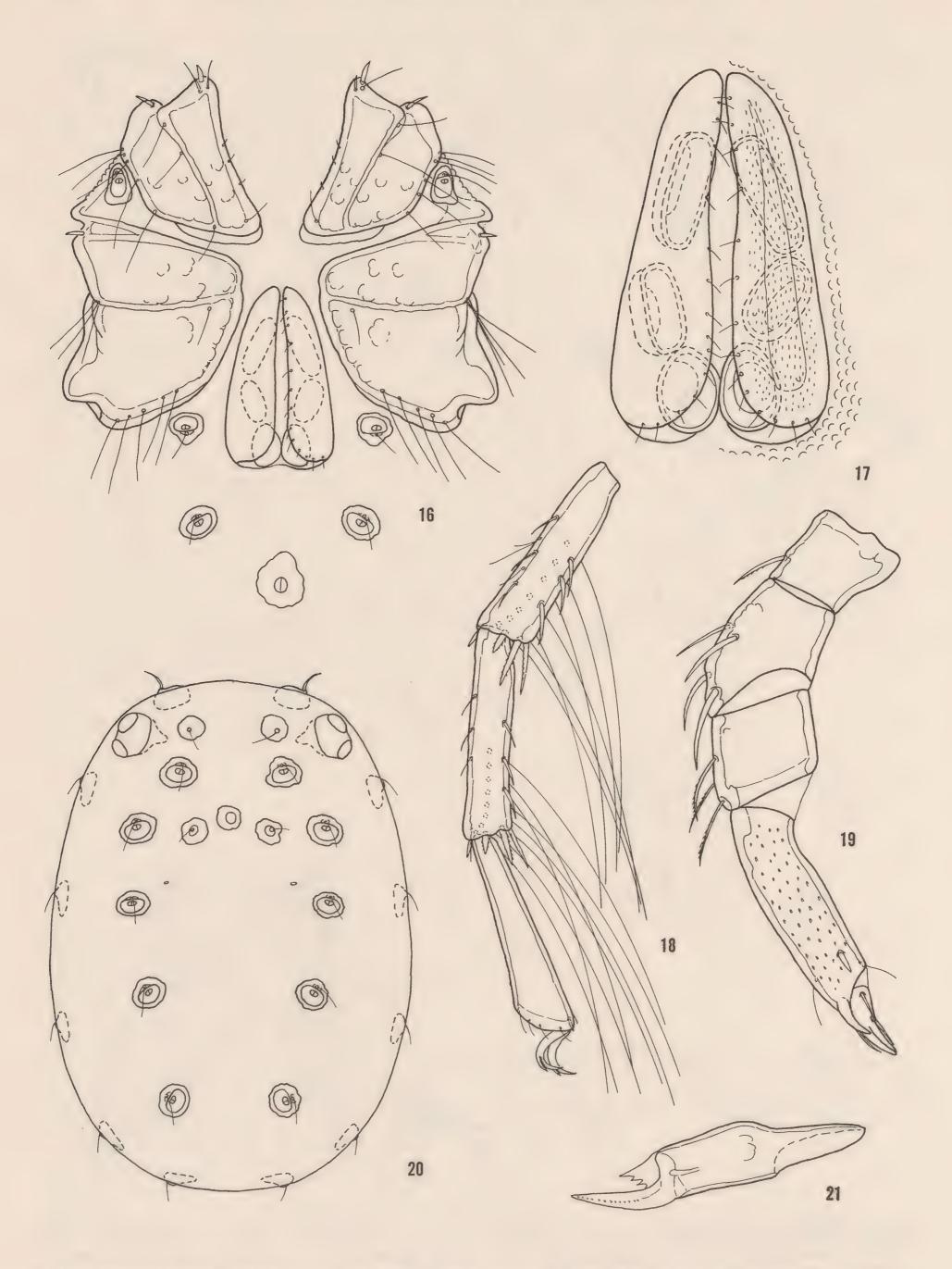
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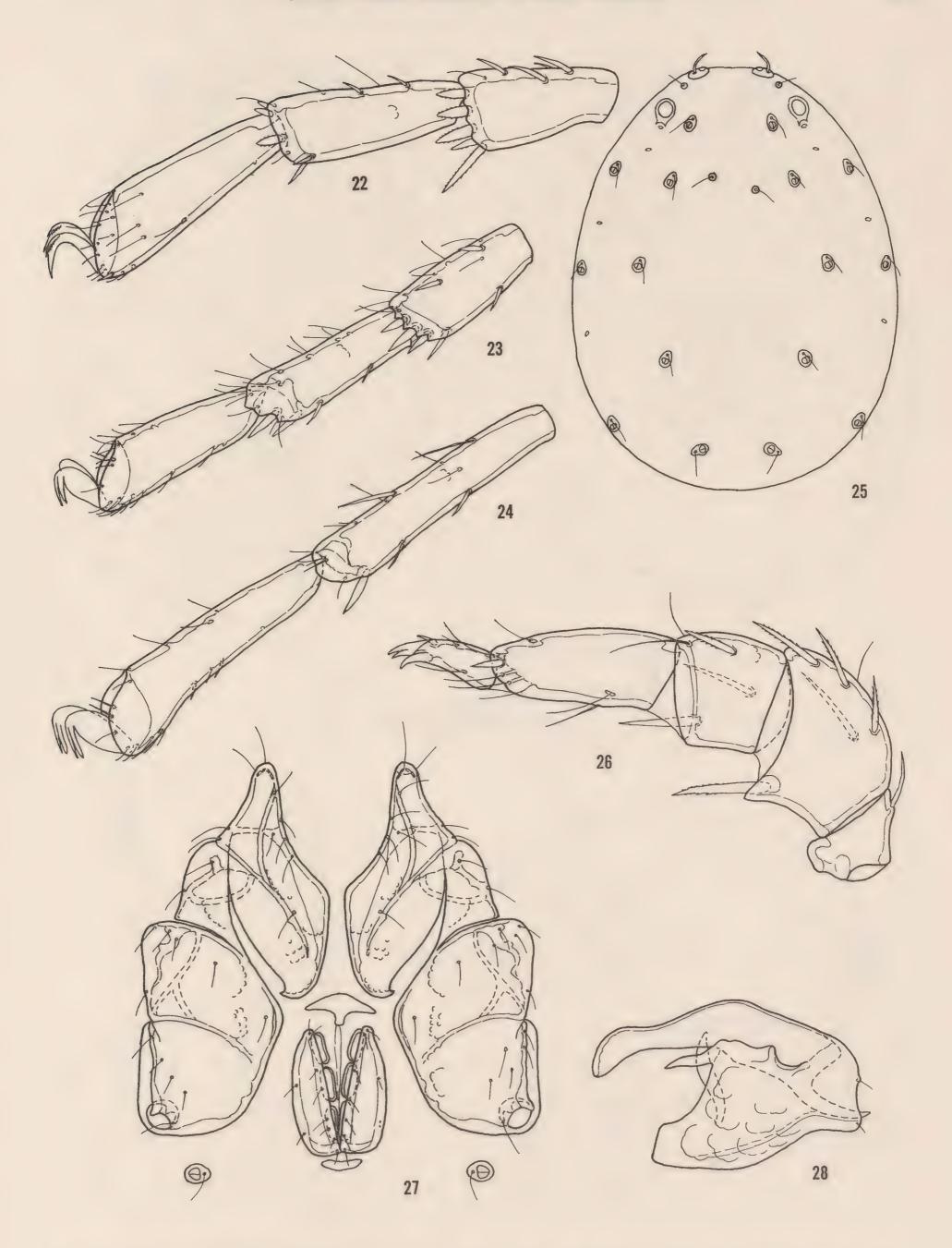
Zelandothyas diamphida n. sp. (Female) Fig. 1, ventral view; Fig. 2, chelicera; Fig. 3, coxal area; Fig. 4, I-Leg-5 and 6; Fig. 5, genital field; Fig. 6, dorsal view.



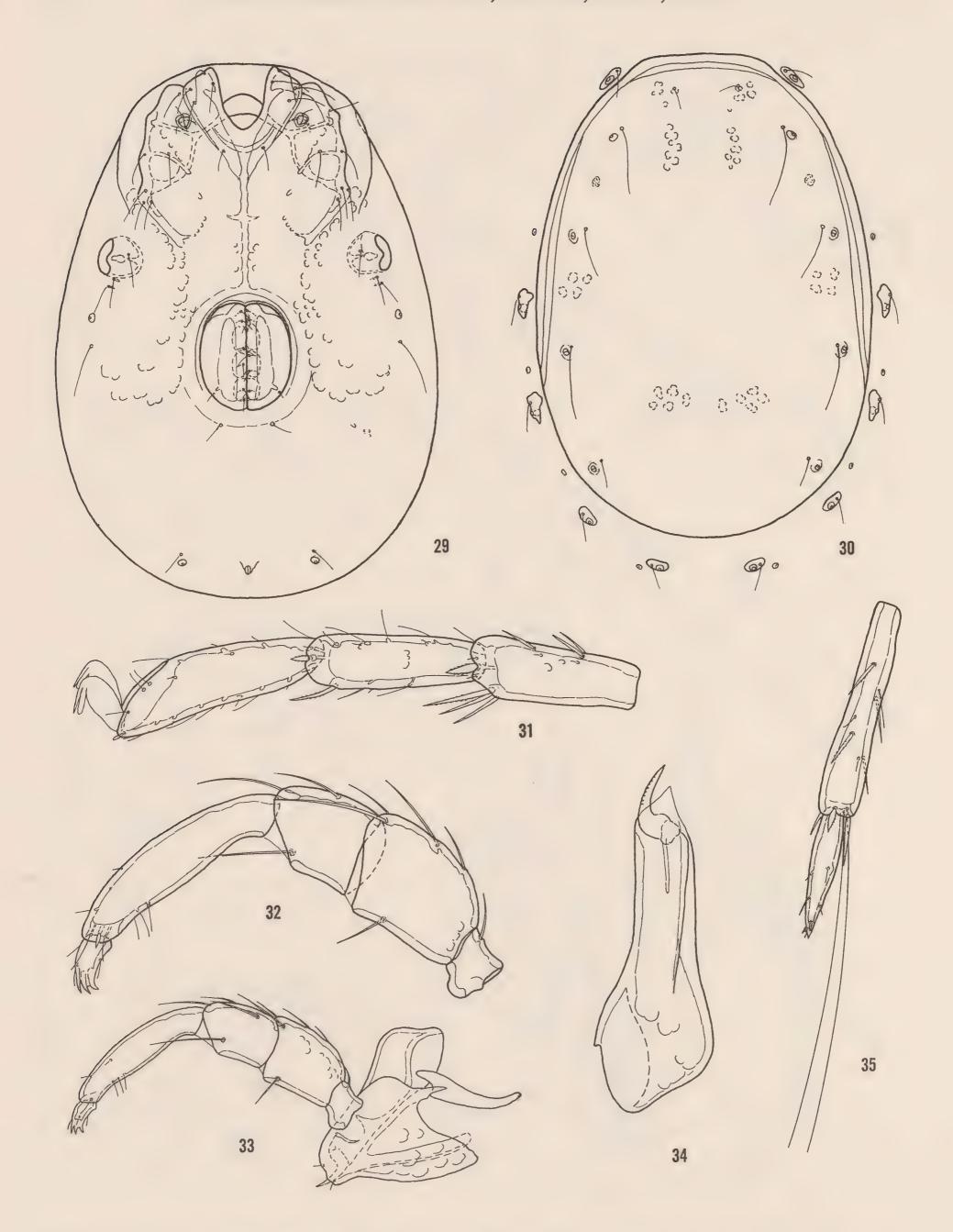
Zelandothyas diamphida n. sp. (Female) Fig. 7, lateral view of capitulum, chelicera and palp; Fig. 8, palp; Fig. 9, anterodorsal sclerites; Fig. 11, claws. Euwandesia tenebrio Hopkins and Schminke (Nymph) Fig. 10, postocularia platelets; Fig. 12, anterodorsal view; Fig. 13, provisional genital field; Fig. 14, distal segments of first leg; Fig. 15 palp.



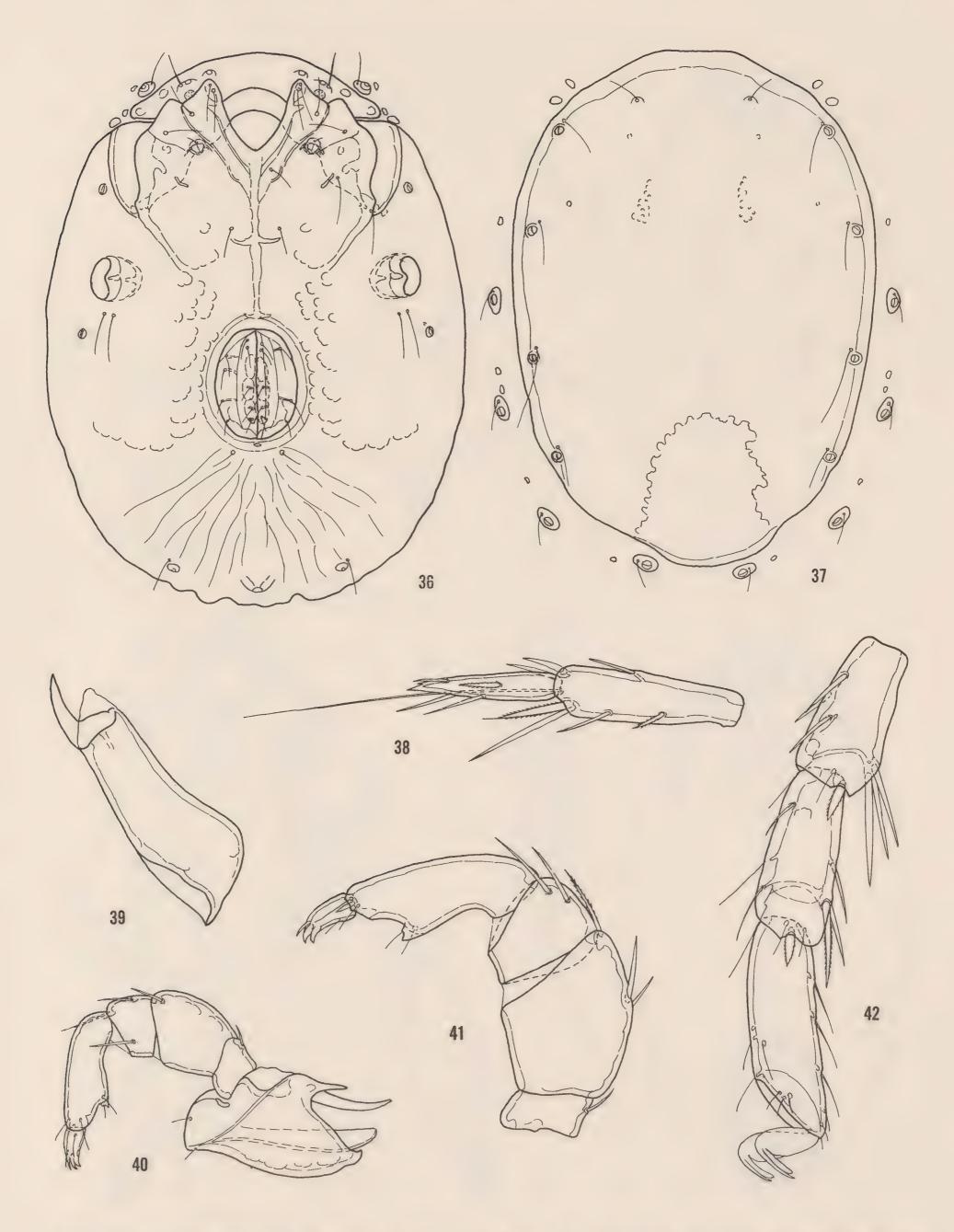
Pseudohydryphantes bebelus n. sp. (Female) Fig. 16, ventral view; Fig. 17, genital field; Fig. 18, distal segments of fourth leg; Fig. 19, palp; Fig. 20, dorsal view; Fig. 21, chelicera.



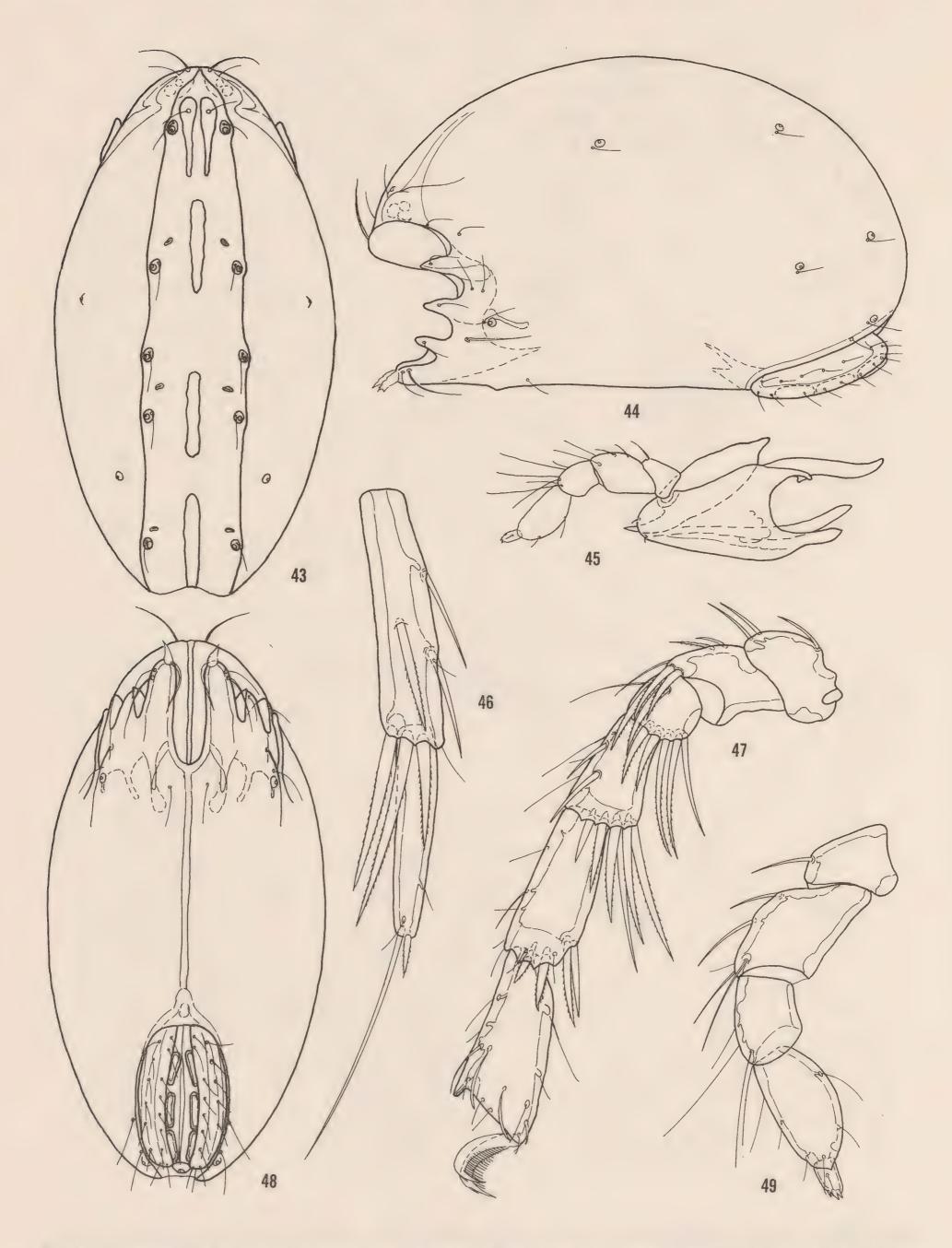
Pseudohydryphantes bebelus n. sp. Fig. 22, distal segments of first leg, \(\frac{\partial}{2} \). Apeltosperchon zelandicus n. sp. (Female) Fig. 23, distal segments of first leg; Fig. 24, IV-Leg-5 and 6; Fig. 25, dorsal view; Fig. 26, palp; Fig. 27, ventral sclerites; Fig. 28, lateral view of capitulum and chelicera.



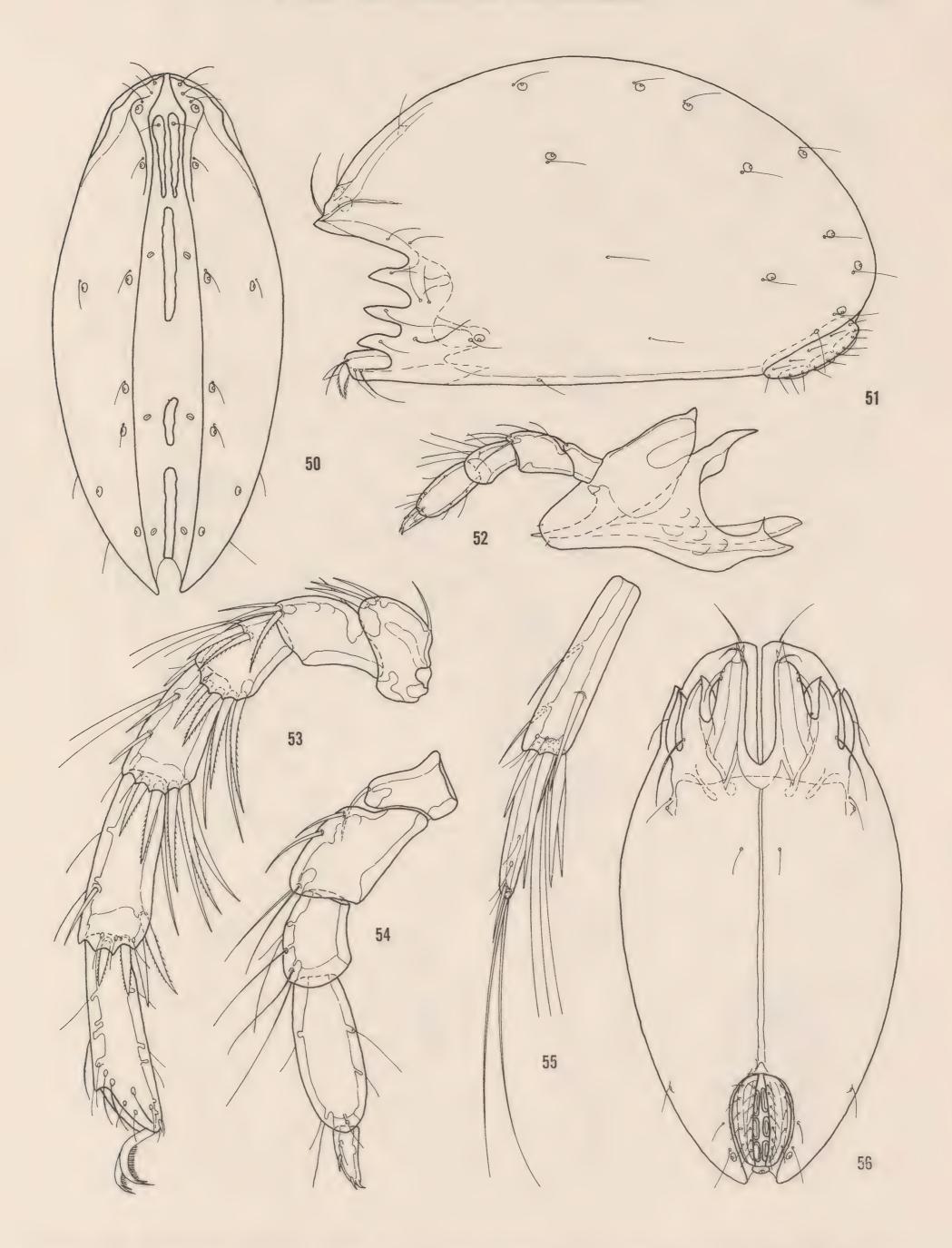
Anisitsiellides arraphus n. sp. (Female) Fig. 29, ventral shield; Fig. 30, dorsal shield; Fig. 31, distal segments of first leg; Fig. 32, palp; Fig. 33, lateral view of capitulum, chelicera and palp; Fig. 34, chelicera; Fig. 35, IV-Leg-5 and 6.



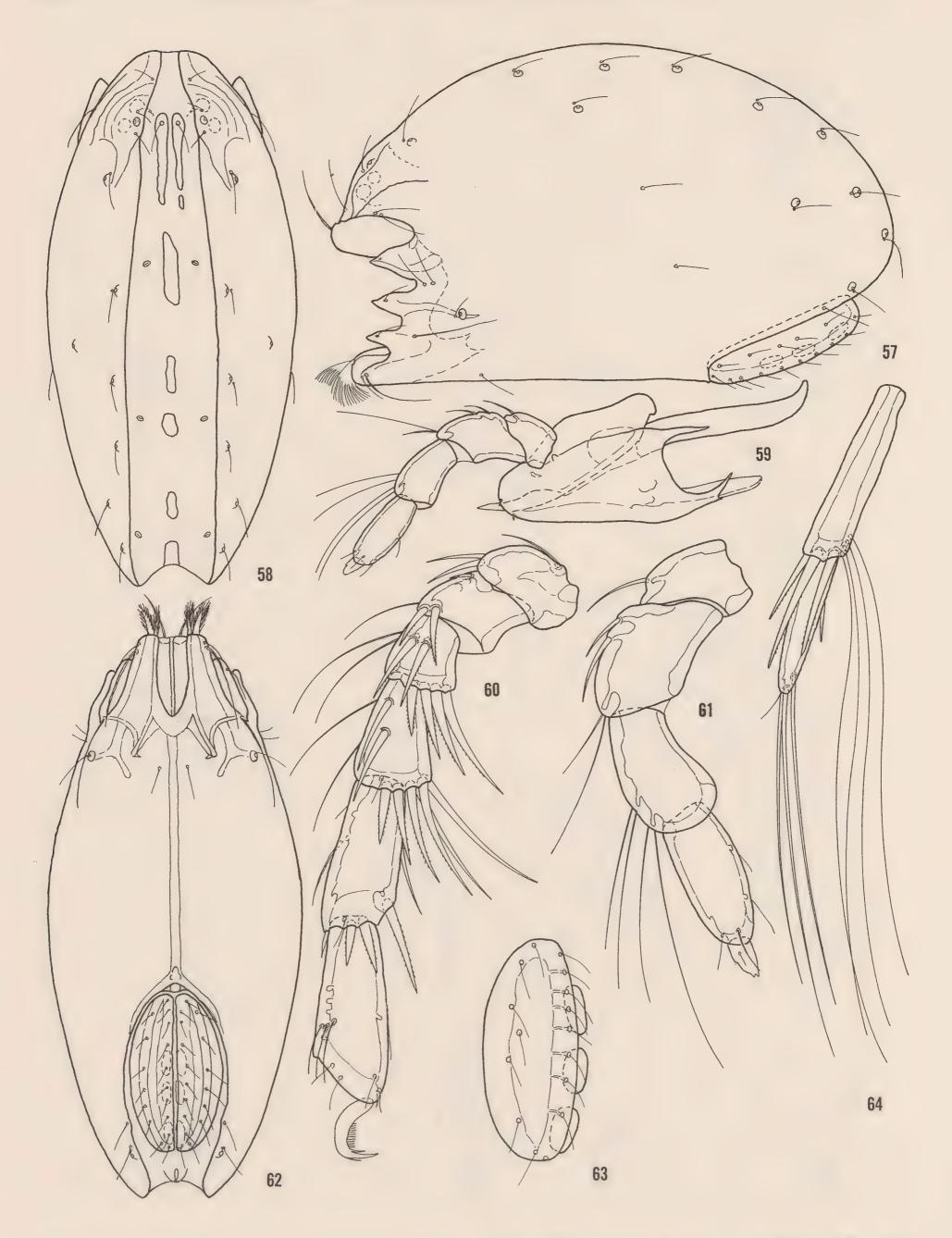
Anisitsiellides partitus n. sp. (Female) Fig. 36, ventral shield; Fig. 37, dorsal shield; Fig. 38, IV-Leg-5 and 6; Fig. 39, chelicera; Fig. 40, lateral view of capitulum, chelicera and palp; Fig. 41, palp; Fig. 42, distal segments of the first leg.



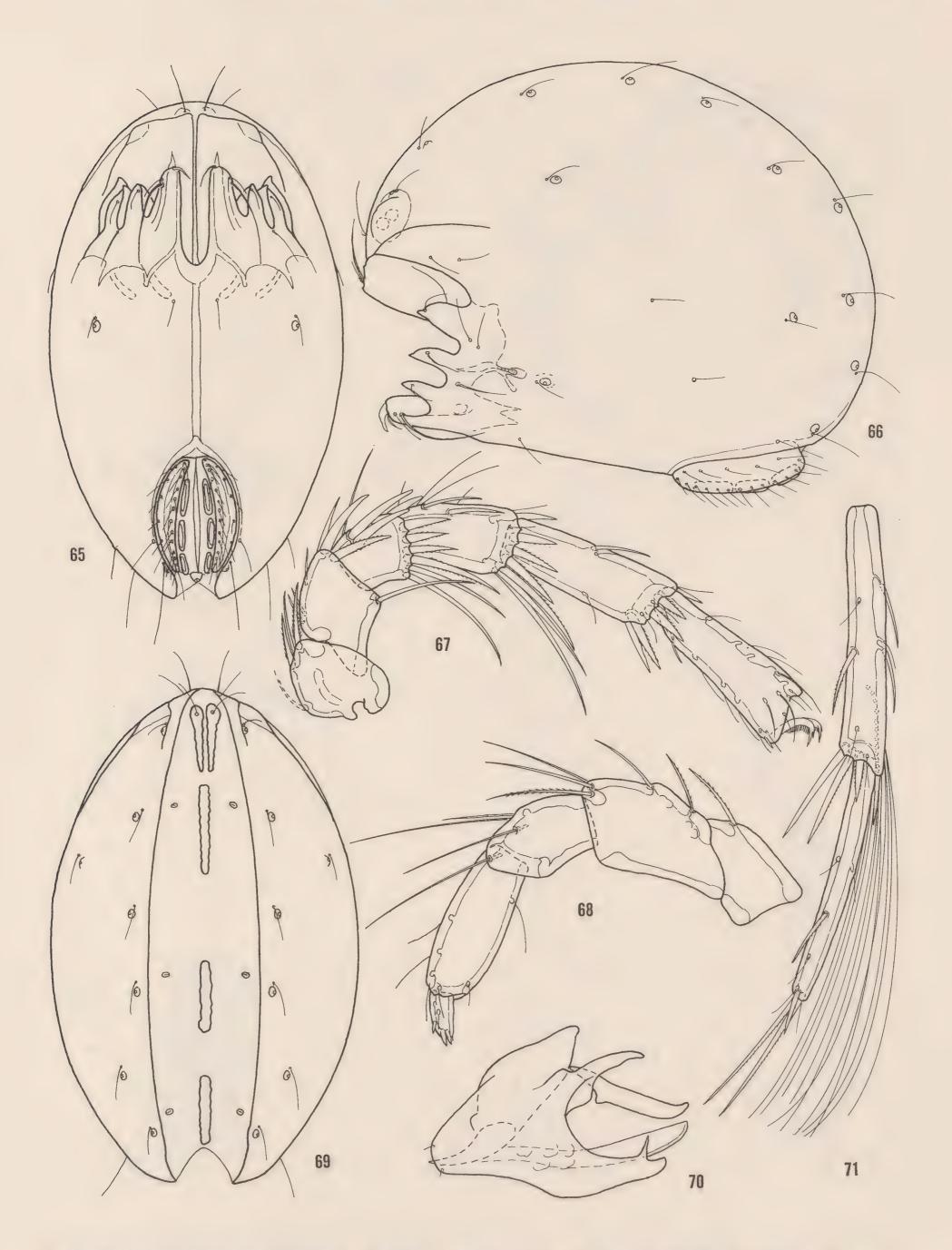
Flabellifrontipoda smithi n. sp. (Female) Fig. 43, dorsal view; Fig. 44, lateral view; Fig. 45, lateral view of capitulum, chelicera and palp; Fig. 46, IV-Leg-5 and 6; Fig. 47, first leg; Fig. 48, ventral view; Fig. 49, palp.



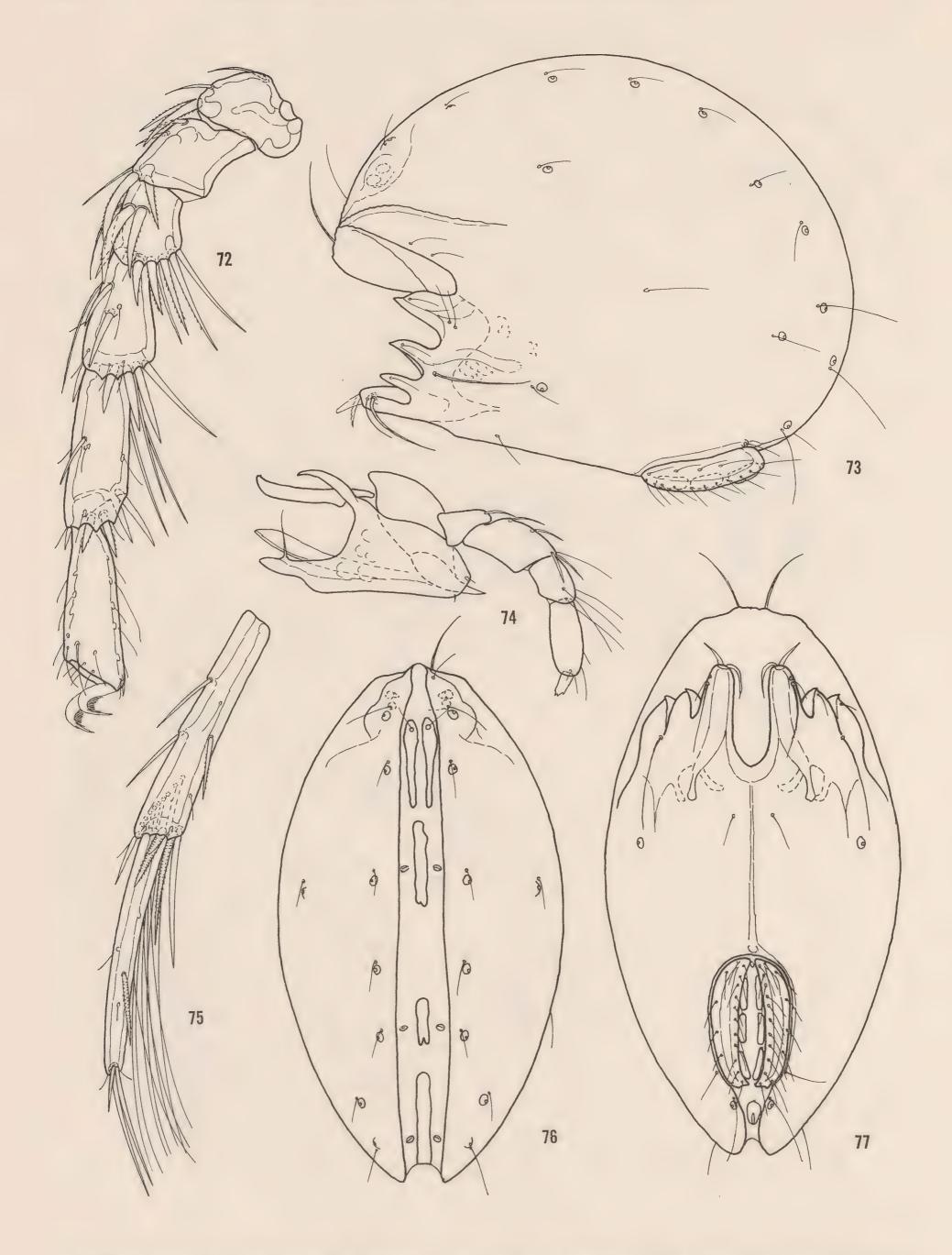
Flabellifrontipoda hadinoma n. sp. (Male) Fig. 50, dorsal view; Fig. 51, lateral view; Fig. 52, lateral view of capitulum, chelicera and palp; Fig. 53, first leg; Fig. 54, palp; Fig. 55, IV-Leg-5 and 6; Fig. 56, ventral view.



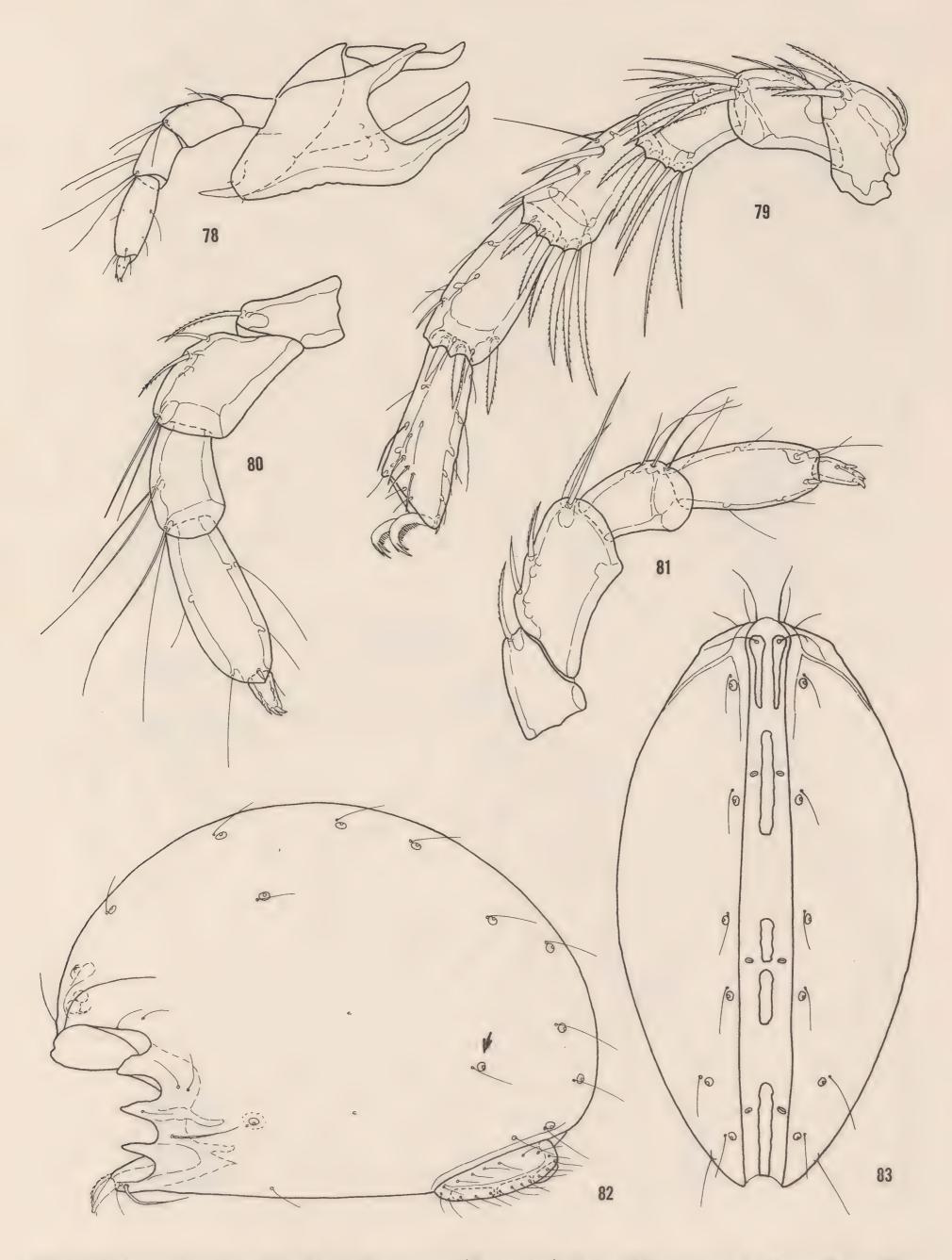
Flabellifrontipoda mastigophora n. sp. Fig. 57, lateral view, \mathcal{P} ; Fig. 58, dorsal view, \mathcal{P} ; Fig. 59, lateral view of capitulum, chelicera and palp, \mathcal{P} ; Fig. 60, first leg, \mathcal{P} ; Fig. 61, palp, \mathcal{P} ; Fig. 62, ventral view, \mathcal{P} ; Fig. 63, genital flaps, \mathcal{P} ; Fig. 64, IV-Leg-5 and 6, \mathcal{P} .



Flabellifrontipoda lacustris n. sp. (Female) Fig. 65, ventral view; Fig. 66, lateral view; Fig. 67, first leg; Fig. 68, palp; Fig. 69, dorsal view; Fig. 70, lateral view of capitulum and chelicera; Fig. 71, IV-Leg-5 and 6.

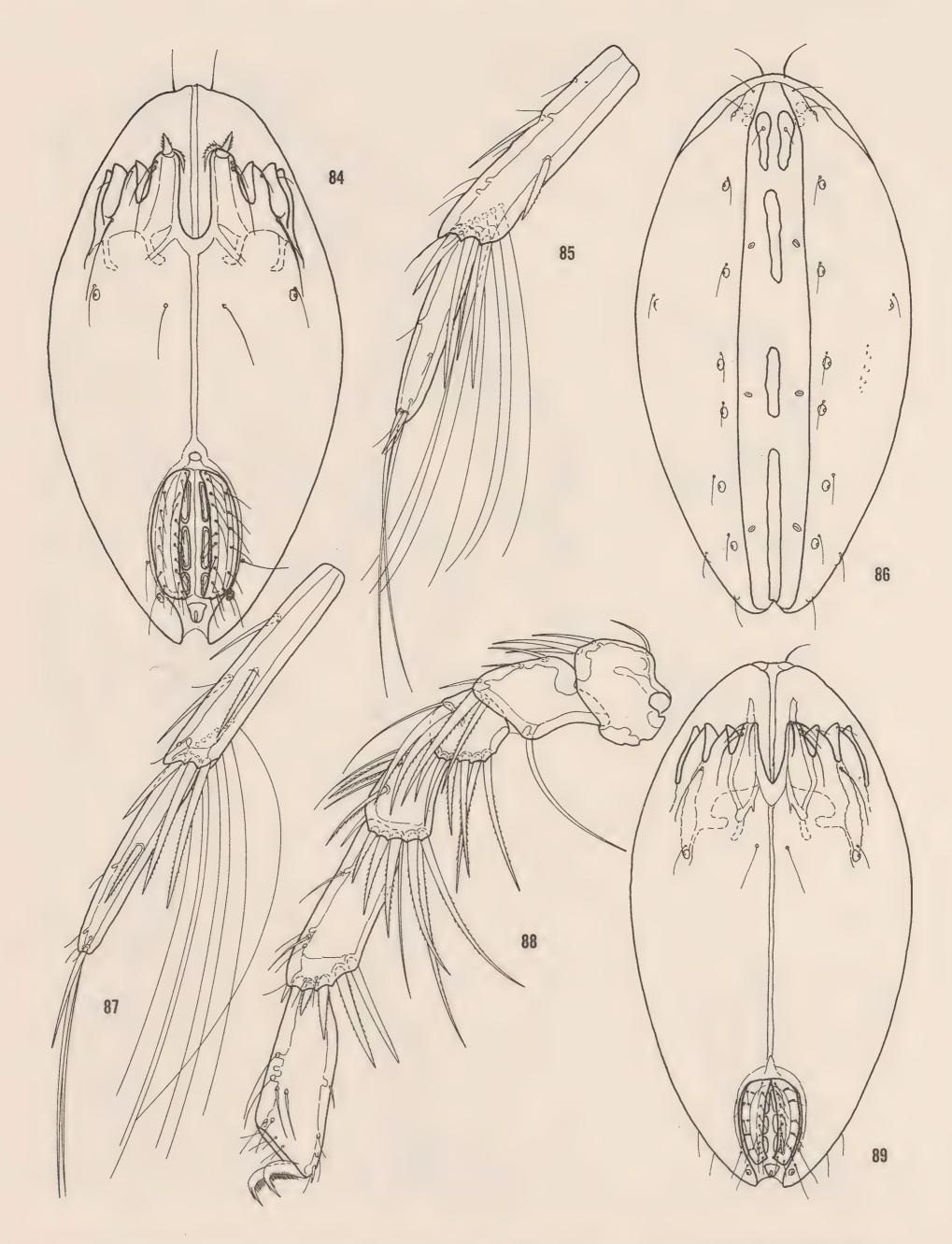


Flabellifrontipoda bravana n. sp. Fig. 72, first leg, o'; Fig. 73, lateral view, o'; Fig. 74, lateral view of capitulum, chelicera and palp, o'; Fig. 75, IV-Leg-5 and 6, o'; Fig. 76, dorsal view, \chi; Fig. 77, ventral view, \chi.



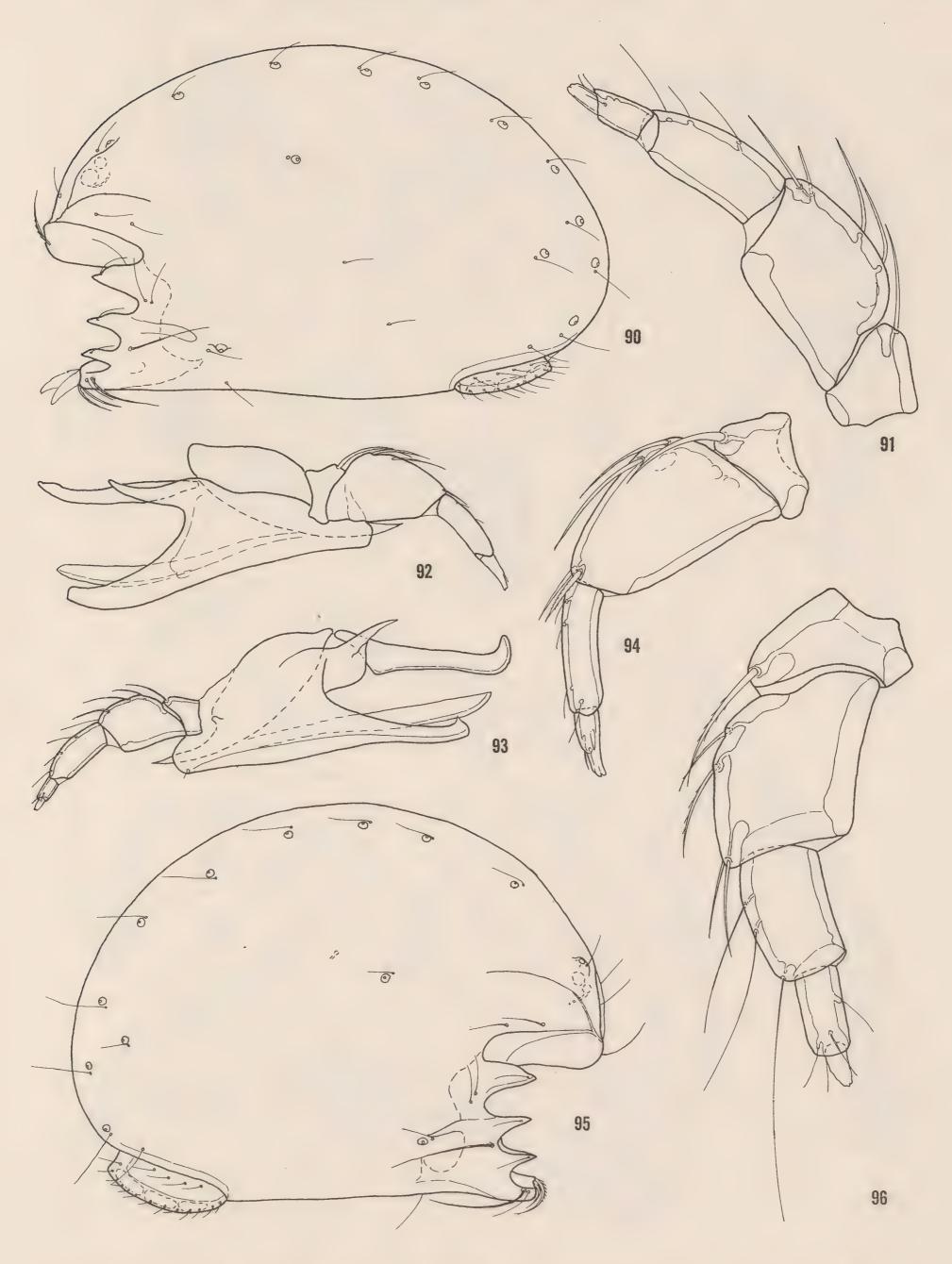
Flabellifrontipoda zelandica Hopkins (Female) Fig. 78, lateral view of capitulum, chelicera and palp; Fig. 79, first leg; Fig. 80, palp; Fig. 82, lateral view; Fig. 83, dorsal view.

Flabellifrontipoda bravana n. sp. Fig. 81, palp, o.

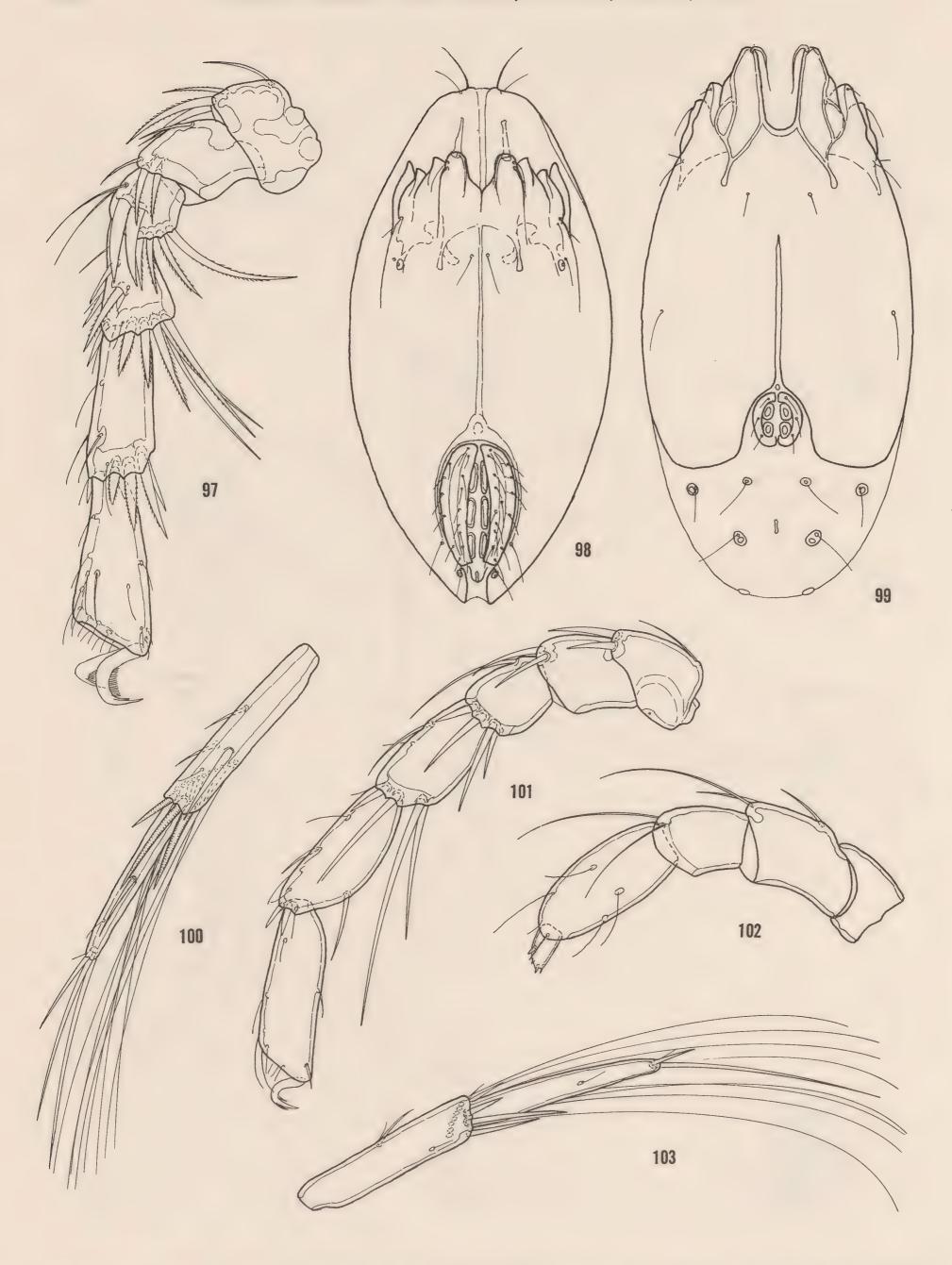


Flabellifrontipoda zelandica Hopkins Fig. 84, ventral view, \$\paraller \text{Fig. 85, IV-Leg-5 and 6, \$\paraller \text{L}}\$

Flabellifrontipoda ladilofa n. sp. (Male) Fig. 86, dorsal view; Fig. 87, IV-Leg-5 and 6; Fig. 88, first leg; Fig. 89, ventral view.

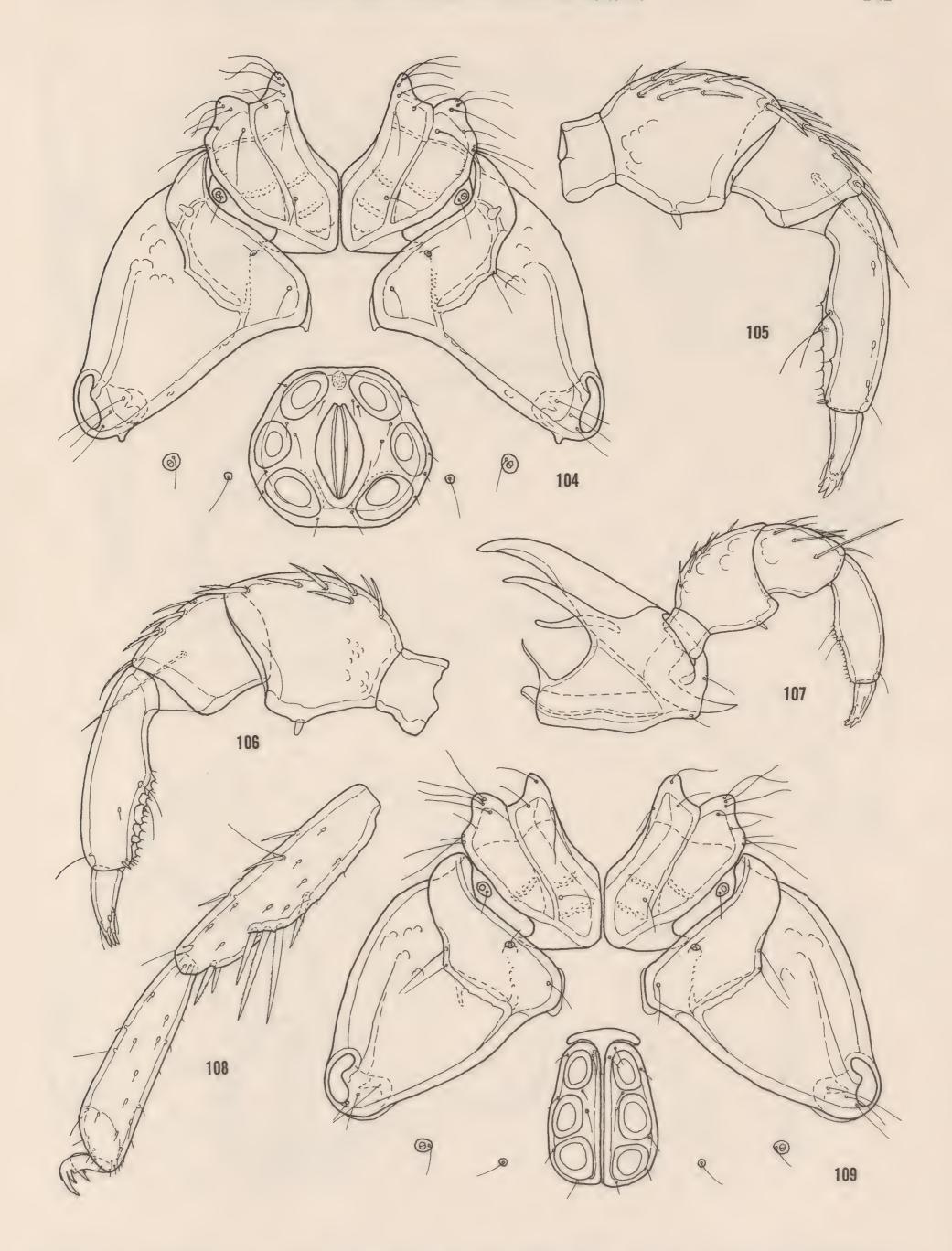


Flabellifrontipoda ladilofa n. sp. (Male) Fig. 90, lateral view; Fig. 91, palp; Fig. 93, lateral view of capitulum, chelicera and palp, Flabellifrontipoda reductipalpa n. sp. (Female) Fig. 92, lateral view of capitulum, chelicera and palp; Fig. 94, palp; Fig. 95, lateral view. Flabellifrontipoda crameri n. sp. Fig. 96, palp, of.

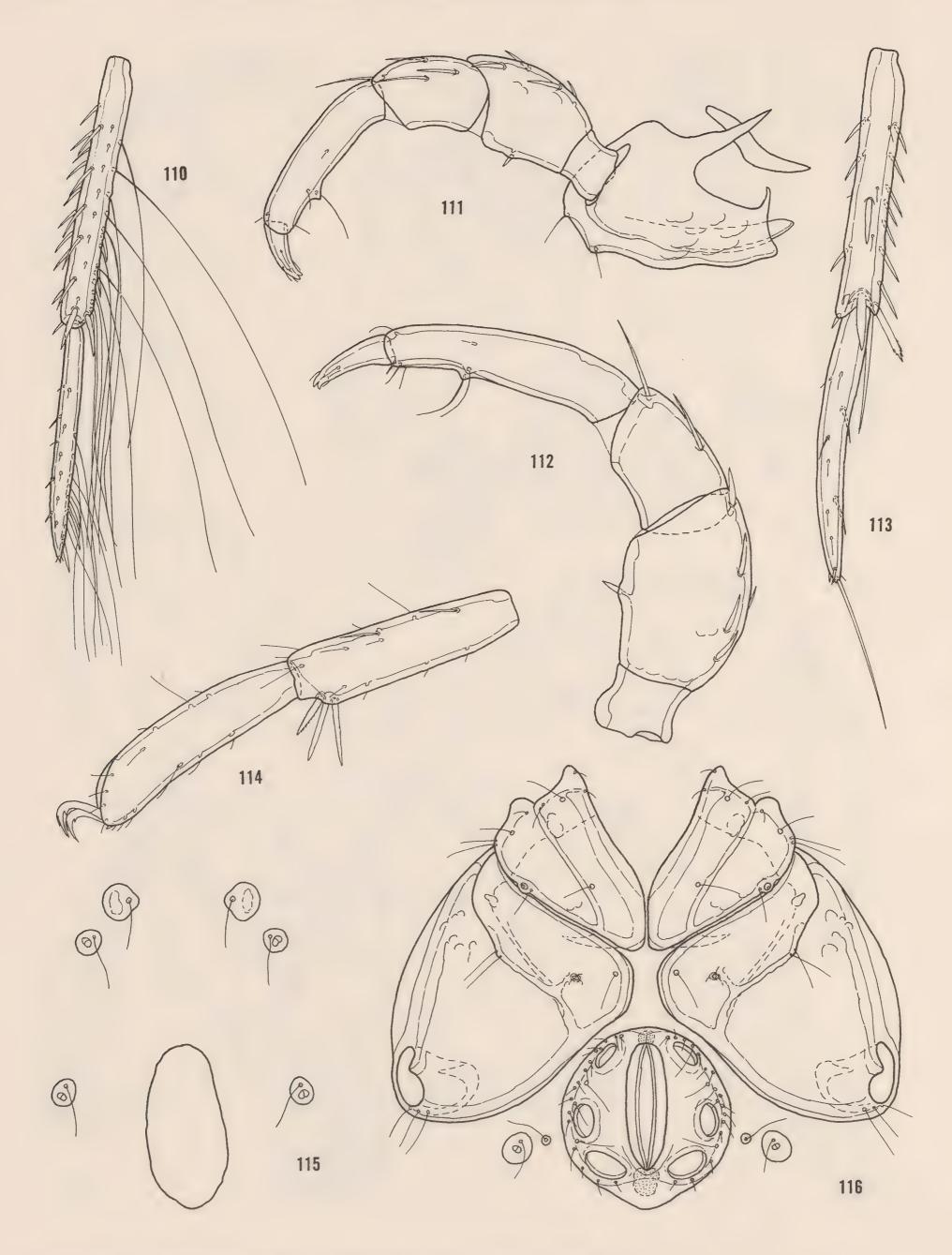


Flabellifrontipoda reductipalpa n. sp. (Female) Fig. 97, first leg; Fig. 98, ventral view; Fig. 100, IV-Leg-5 and 6.

Oxus sp. (Nymph) Fig. 99, ventral view; Fig. 101, first leg; Fig. 102, palp; Fig. 103, IV-Leg-5 and 6.

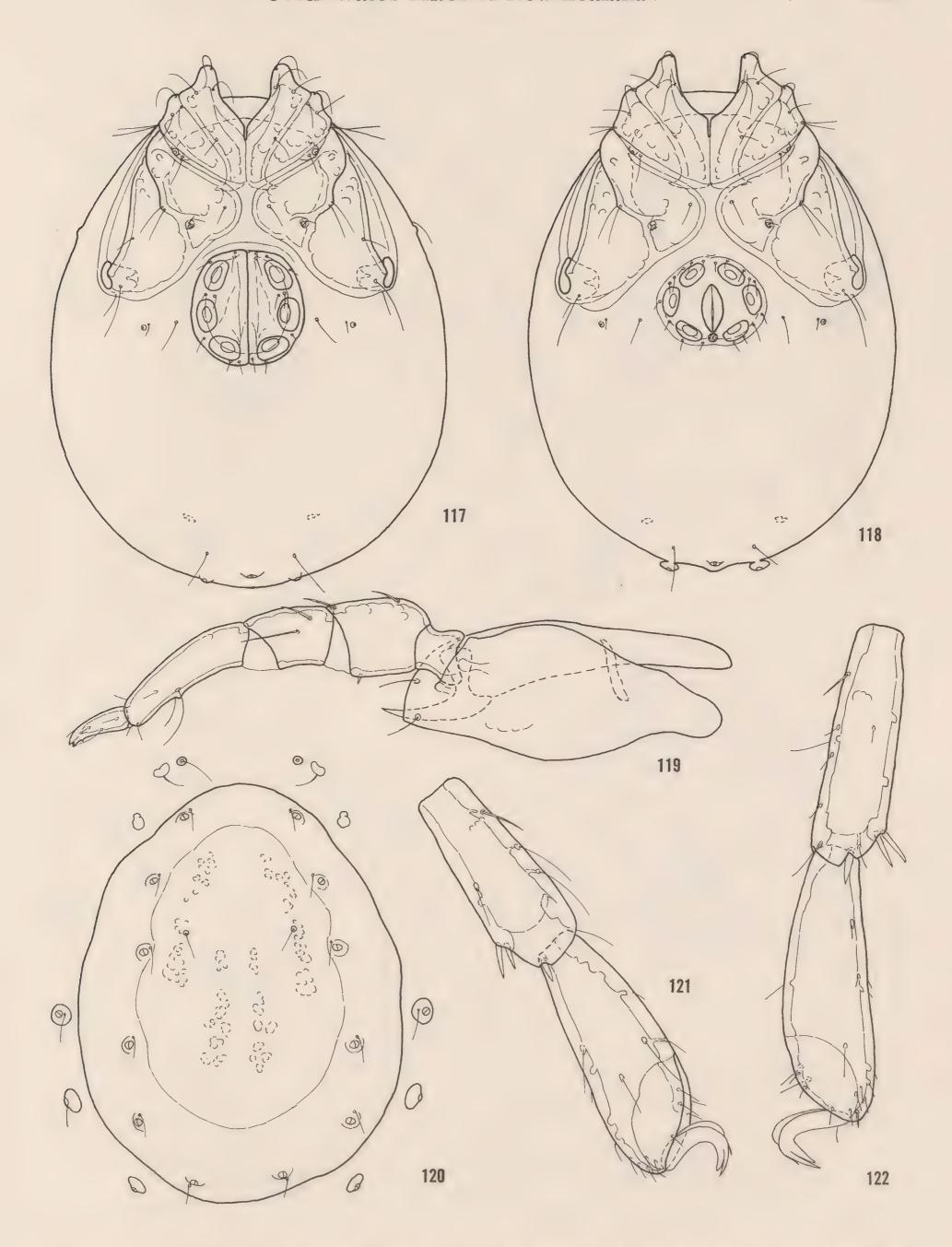


Limnesia foldoma n. sp. Fig. 104, ventral sclerites, o'; Fig. 105, palp, \cong; Fig. 106, palp, o'; Fig. 107, lateral view of capitulum, chelicera and palp, o'; Fig. 108, I-Leg-5 and 6, \cong; Fig. 109, ventral sclerites, \cong.



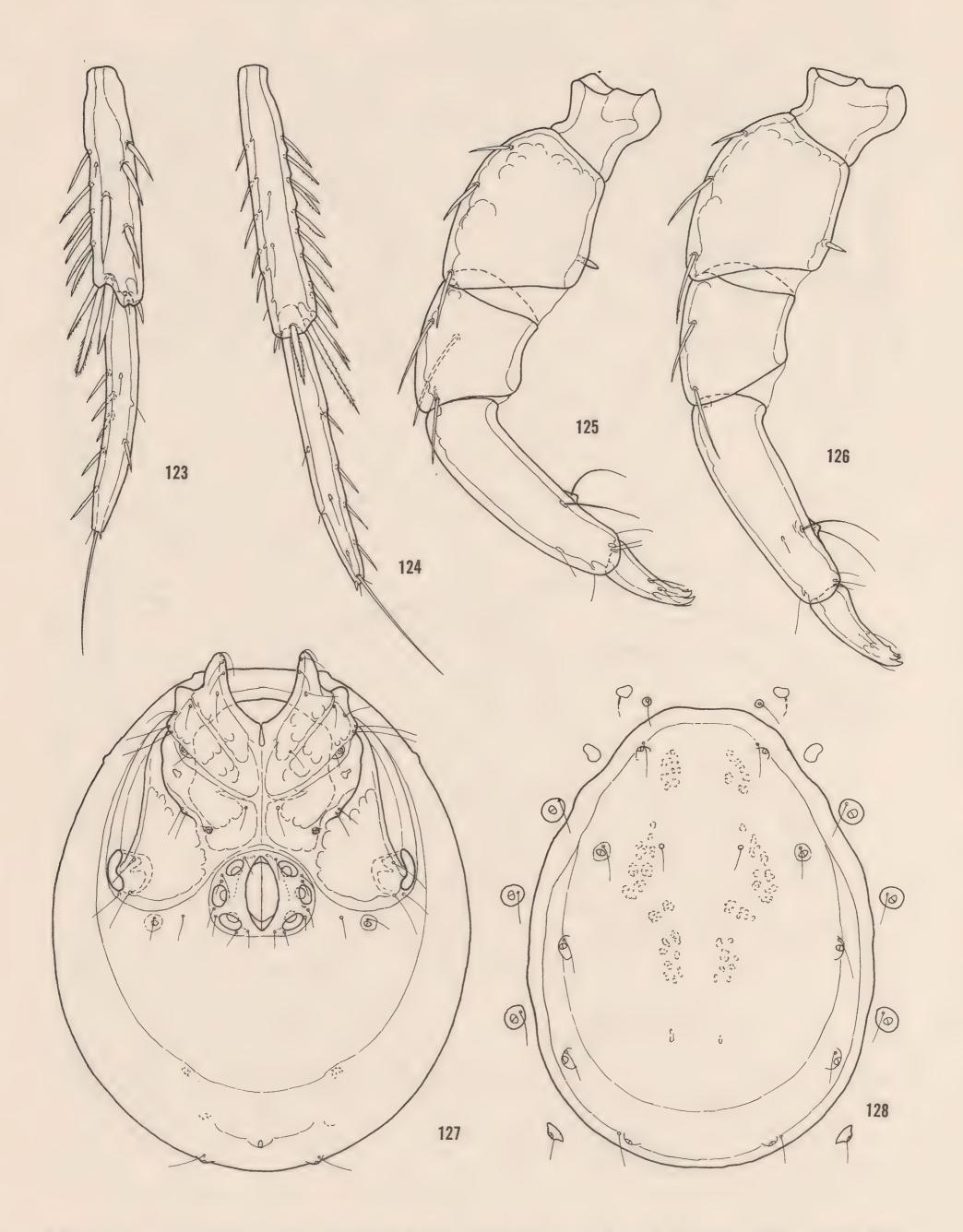
Limnesia foldoma n. sp. Fig. 110, IV-Leg-5 and 6, \(\frac{9}{2} \).

Limnesia reptans Hopkins (Male) Fig. 111, lateral view of capitulum, chelicera and palp; Fig. 112, palp; Fig. 113, IV-Leg-5 and 6; Fig. 114, I-Leg-5 and 6; Fig. 115, dorsal platelet; Fig. 116, ventral sclerites.



Limnesia zelandica n. sp. Fig. 117, ventral shield, $\cite{1}$; Fig. 118, ventral shield, $\cite{1}$; Fig. 119, lateral view of capitulum, chelicera and palp, $\cite{1}$; Fig. 120, dorsal shield, $\cite{1}$; Fig. 122, I-Leg-5 and 6, $\cite{1}$.

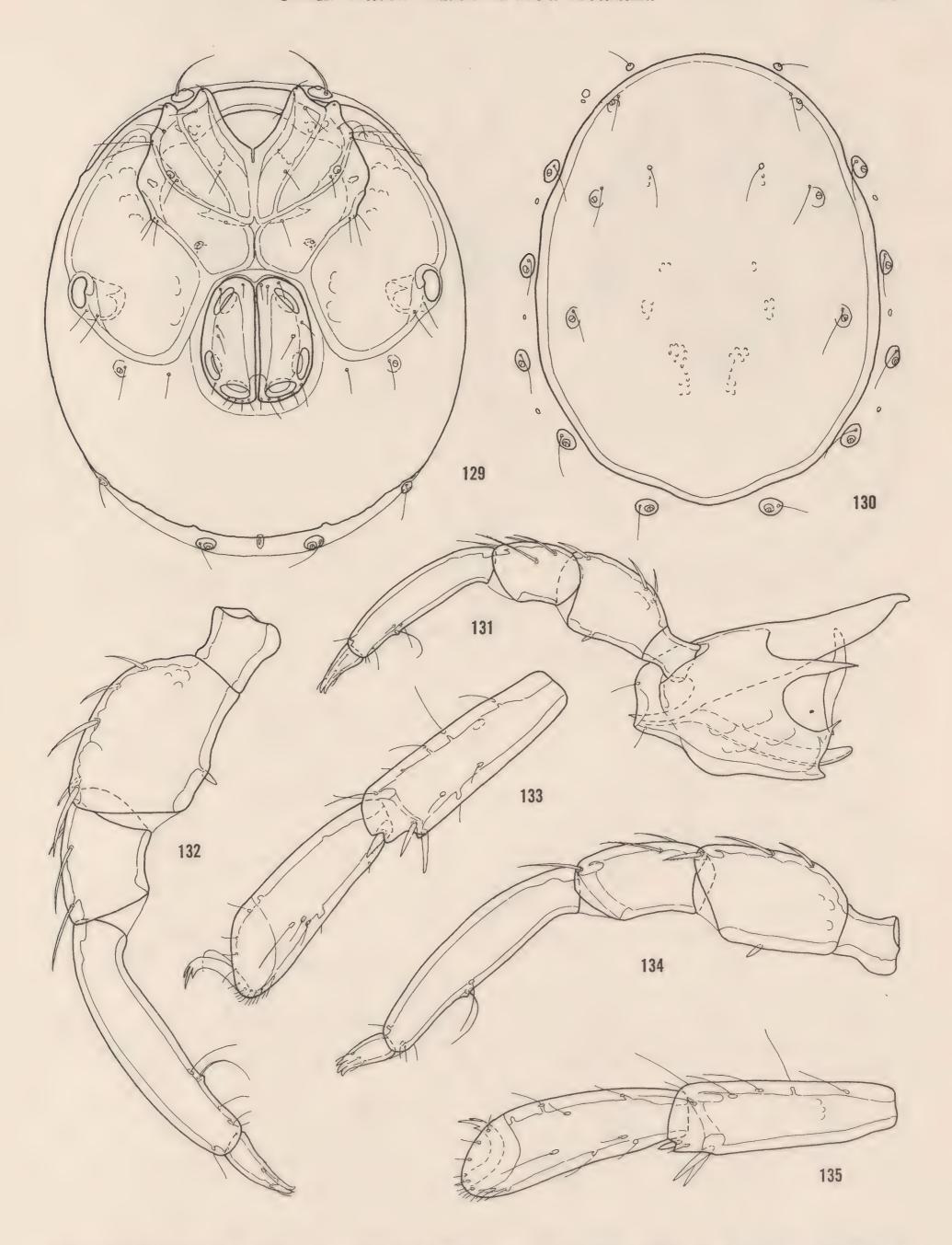
Limnesia conroyi n. sp. Fig. 121, I-Leg-5 and 6, $\cite{1}$.



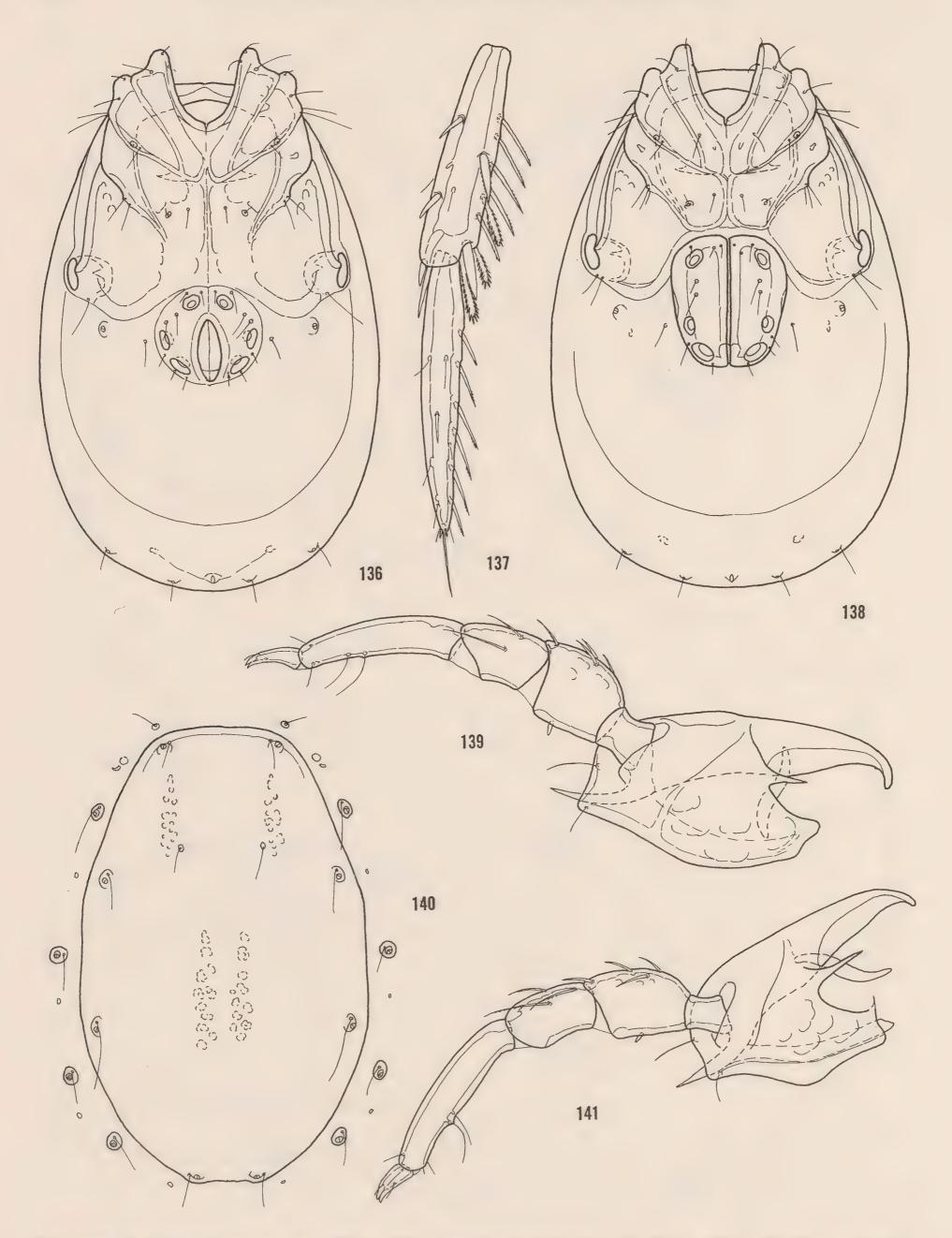
Limnesia conroyi n. sp. (Male) Fig. 123, IV-Leg-5 and 6; Fig. 125, palp; Fig. 127, ventral shield; Fig. 128, dorsal shield.

Limnesia auspexa n. sp. Fig. 124, IV-Leg-5 and 6, \(\beta\).

Limnesia zelandica n. sp. Fig. 126, palp, \(\beta\).

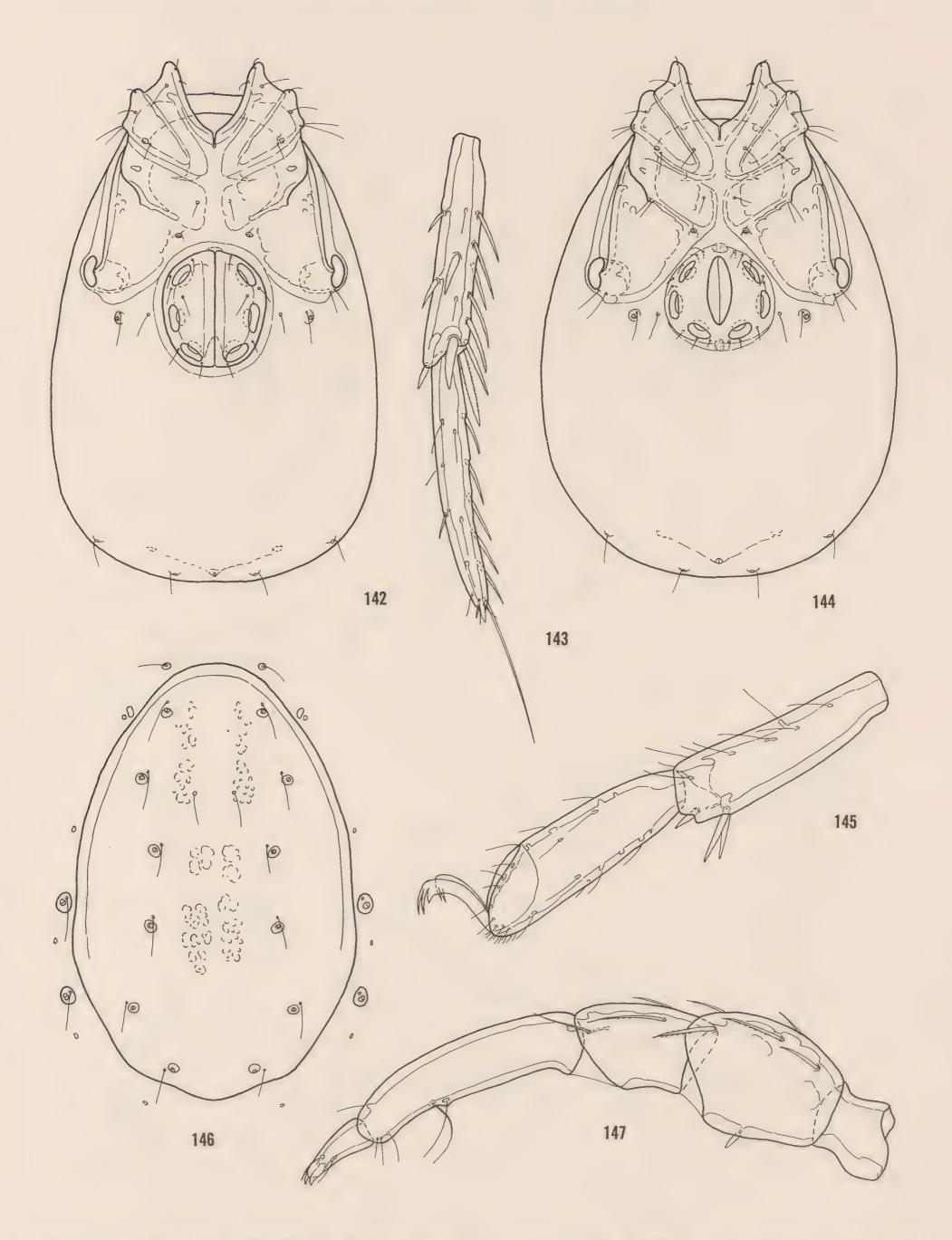


Limnesia auspexa n. sp. (Female) Fig. 129, ventral shield; Fig. 130, dorsal shield; Fig. 131, lateral view of capitulum, chelicera and palp; Fig. 132, palp; Fig. 133, I-Leg-5 and 6.
Limnesia birgelda n. sp. Fig. 134, palp, \(\partial \); Fig. 135, I-Leg-5 and 6, \(\partial \).

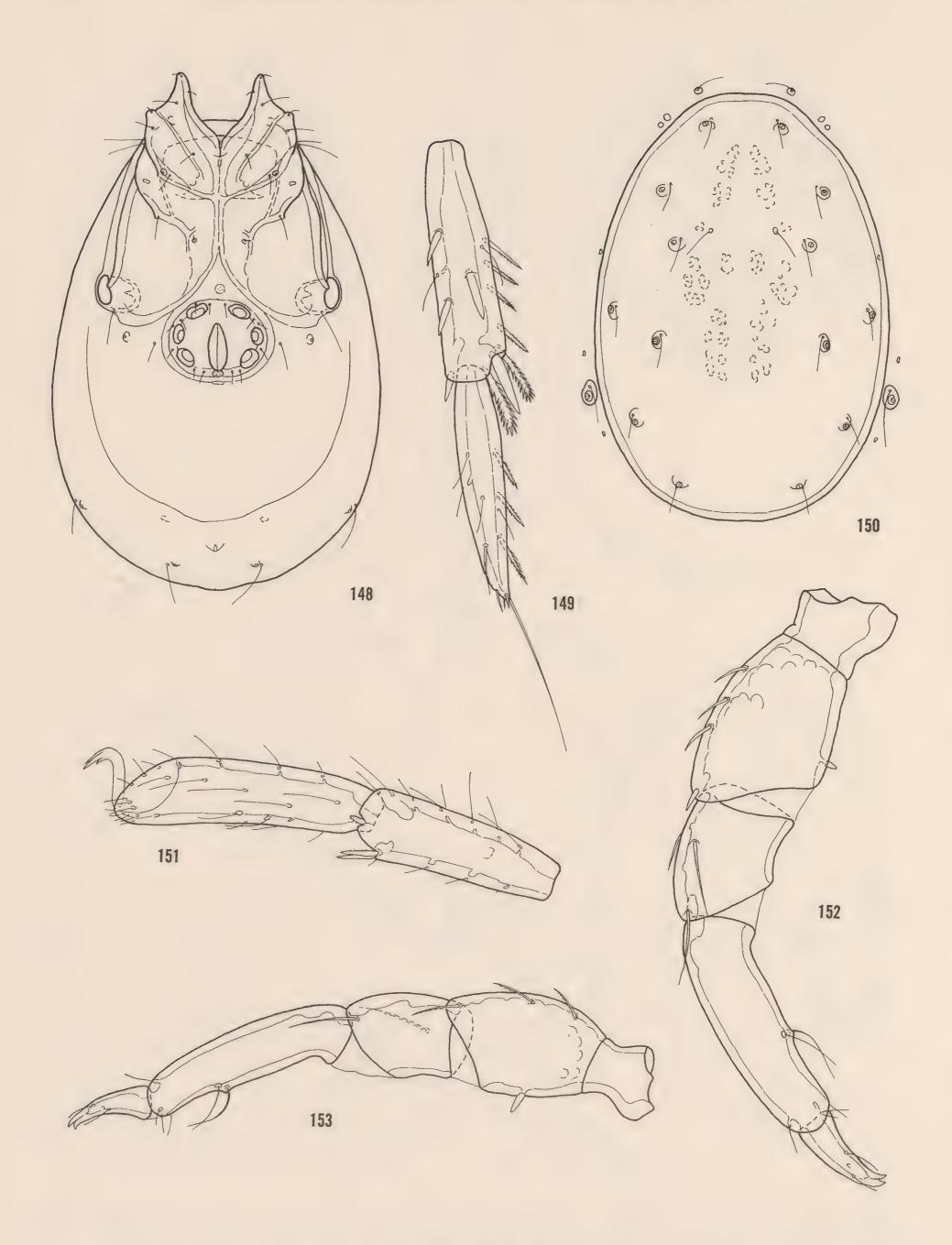


Limnesia birgelda n. sp. Fig. 136, ventral shield, o'; Fig. 137, IV-Leg-5 and 6, \Parallel Fig. 138, ventral shield, \Parallel Fig. 140, dorsal shield, o'; Fig. 141, lateral view of capitulum, chelicera and palp, \Parallel .

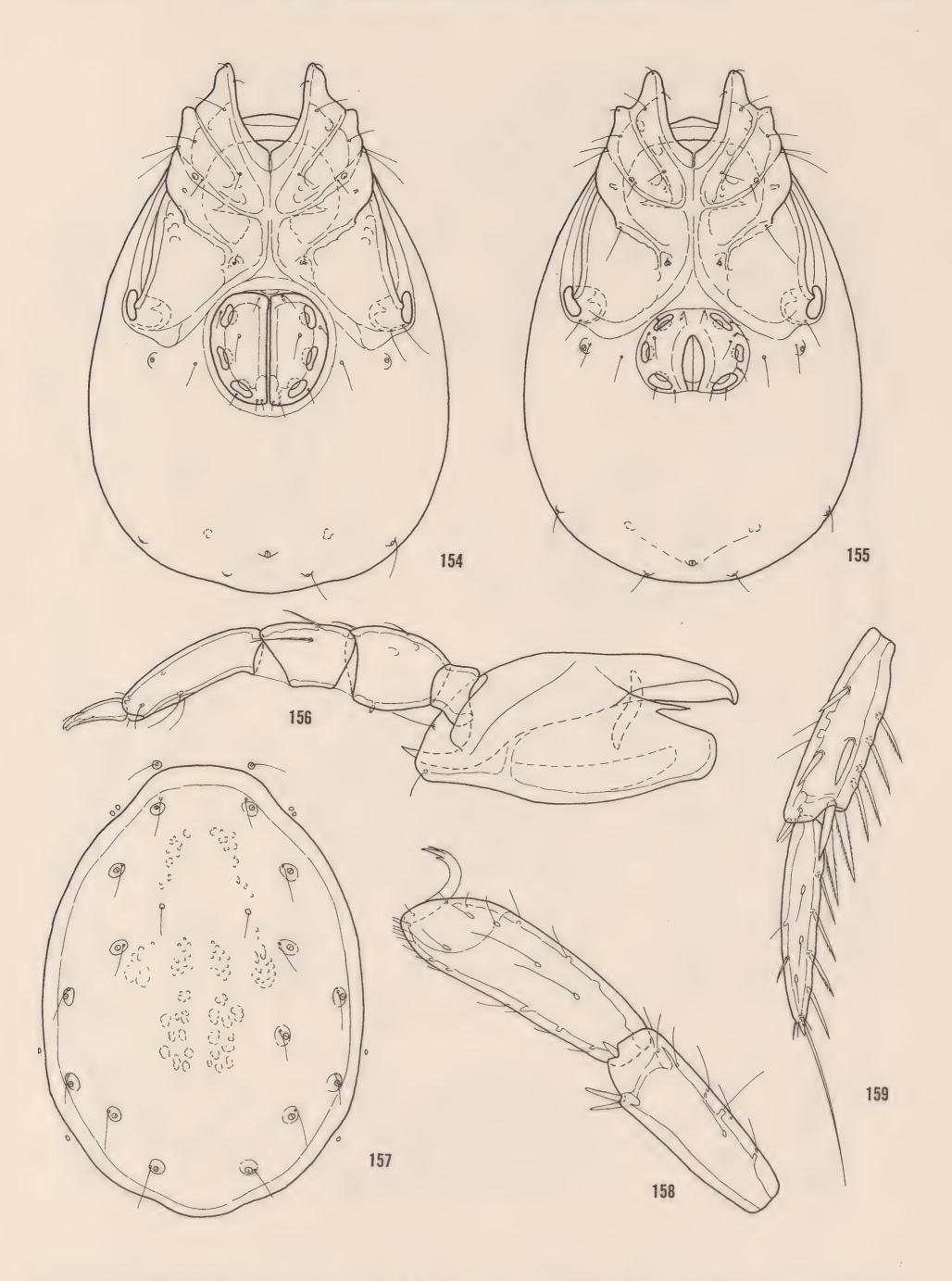
Limnesia testacea Hopkins Fig. 139, lateral view of capitulum, chelicera and palp, \circ .



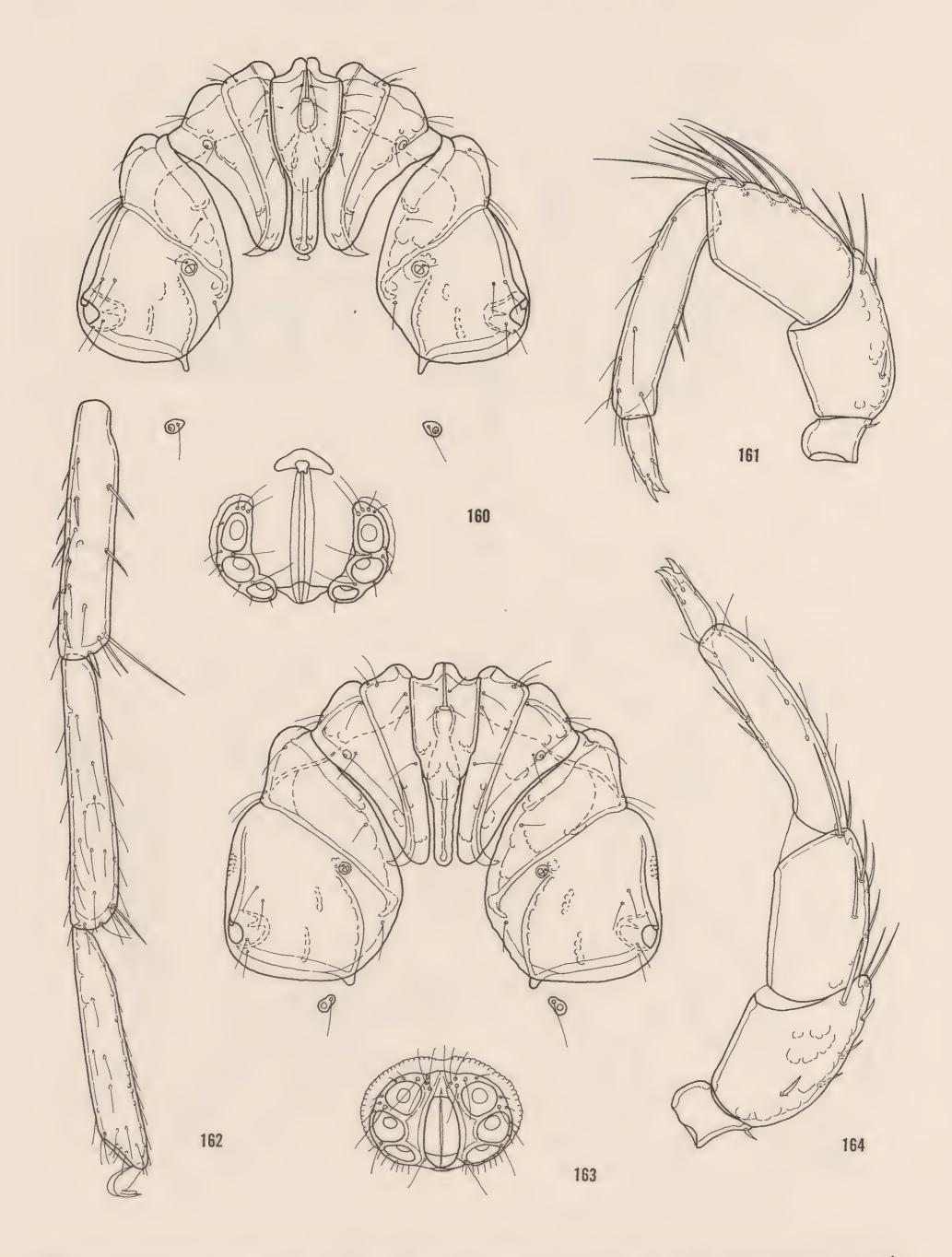
Limnesia testacea Hopkins Fig. 142, ventral shield, φ ; Fig. 143, IV-Leg-5 and 6, σ ; Fig. 144, ventral shield, σ ; Fig. 145, I-Leg-5 and 6, σ ; Fig. 146, dorsal shield, φ ; Fig. 147, palp, φ .



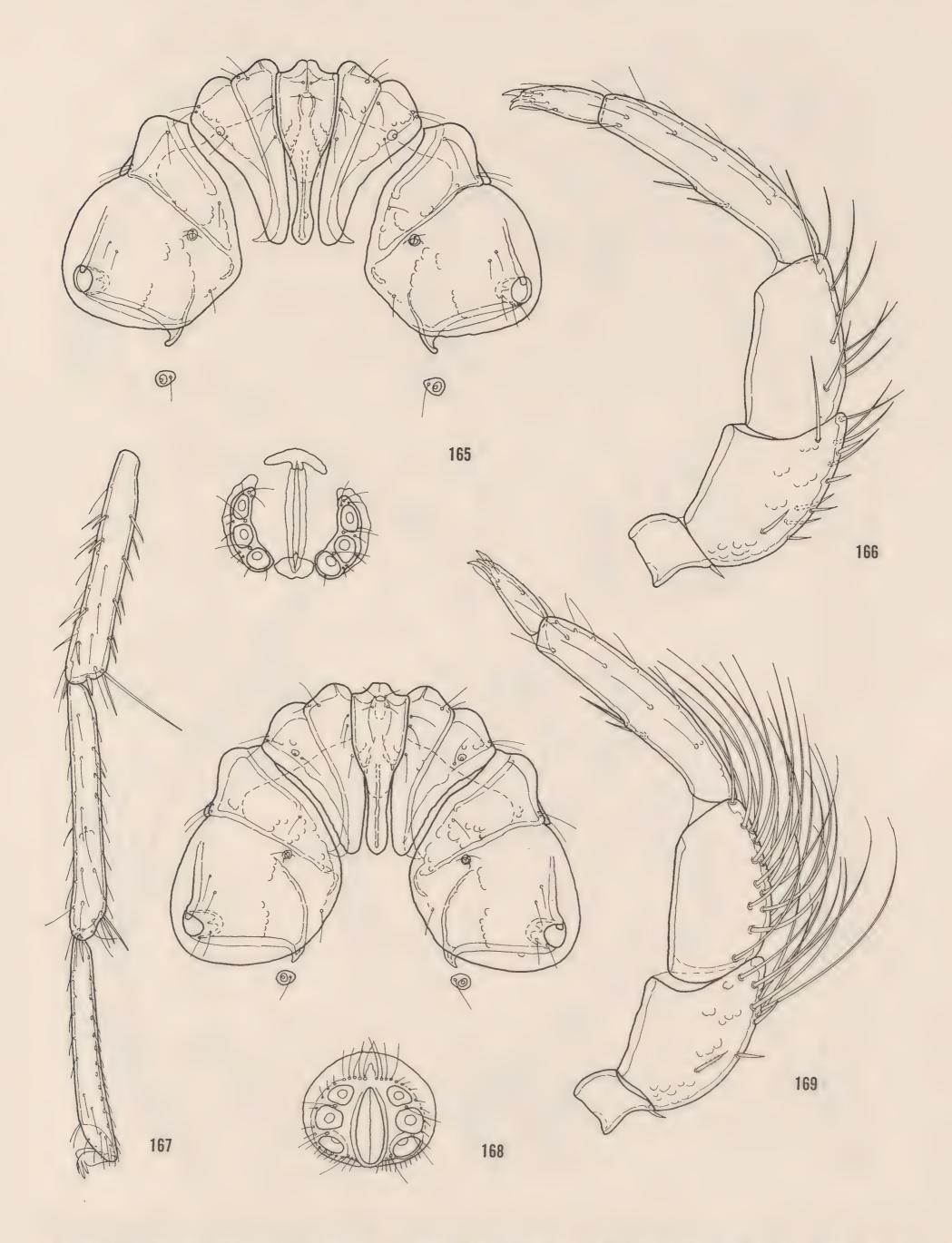
Limnesia halcarda n. sp. (Male) Fig. 148, ventral shield; Fig. 149, IV-Leg-5 and 6; Fig. 150, dorsal shield; Fig. 151, I-Leg-5 and 6; Fig. 153, palp. Limnesia crowelli n. sp. Fig. 152, palp, \(\partial \).



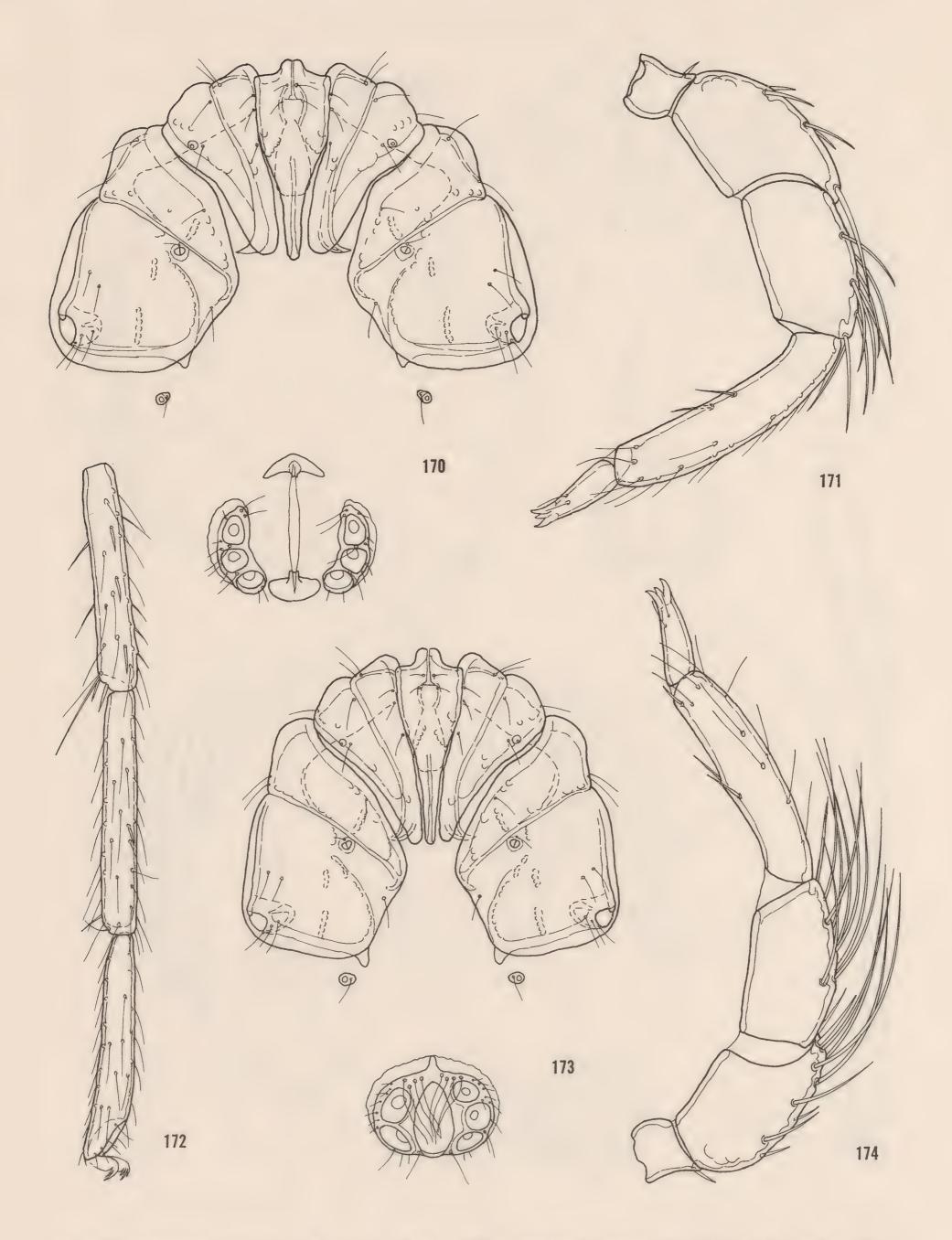
Limnesia crowelli n. sp. Fig. 154, ventral shield, $\[\]$; Fig. 155, ventral shield, $\[\]$; Fig. 156, lateral view of capitulum, chelicera and palp, $\[\]$; Fig. 157, dorsal shield, $\[\]$; Fig. 158, I-Leg-5 and 6, $\[\]$; Fig. 159, IV-Leg-5 and 6, $\[\]$.



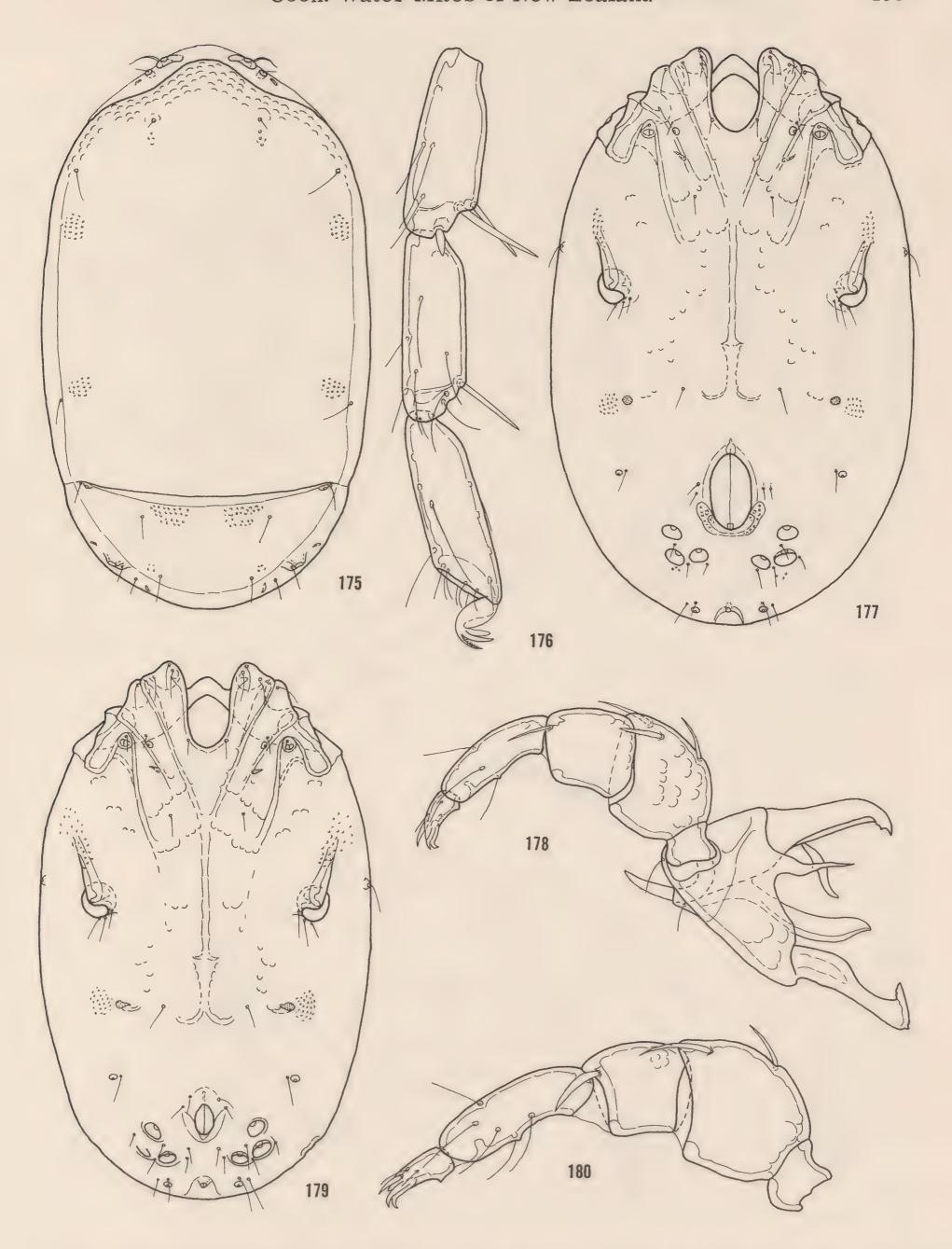
Australiobates vietsi n. sp. Fig. 160, ventral sclerites, \(\phi\); Fig. 161, palp, \(\sigma\); Fig. 162, distal segments of first leg, \(\phi\); Fig. 163, ventral sclerites, \(\sigma\); Fig. 164, palp, \(\phi\).



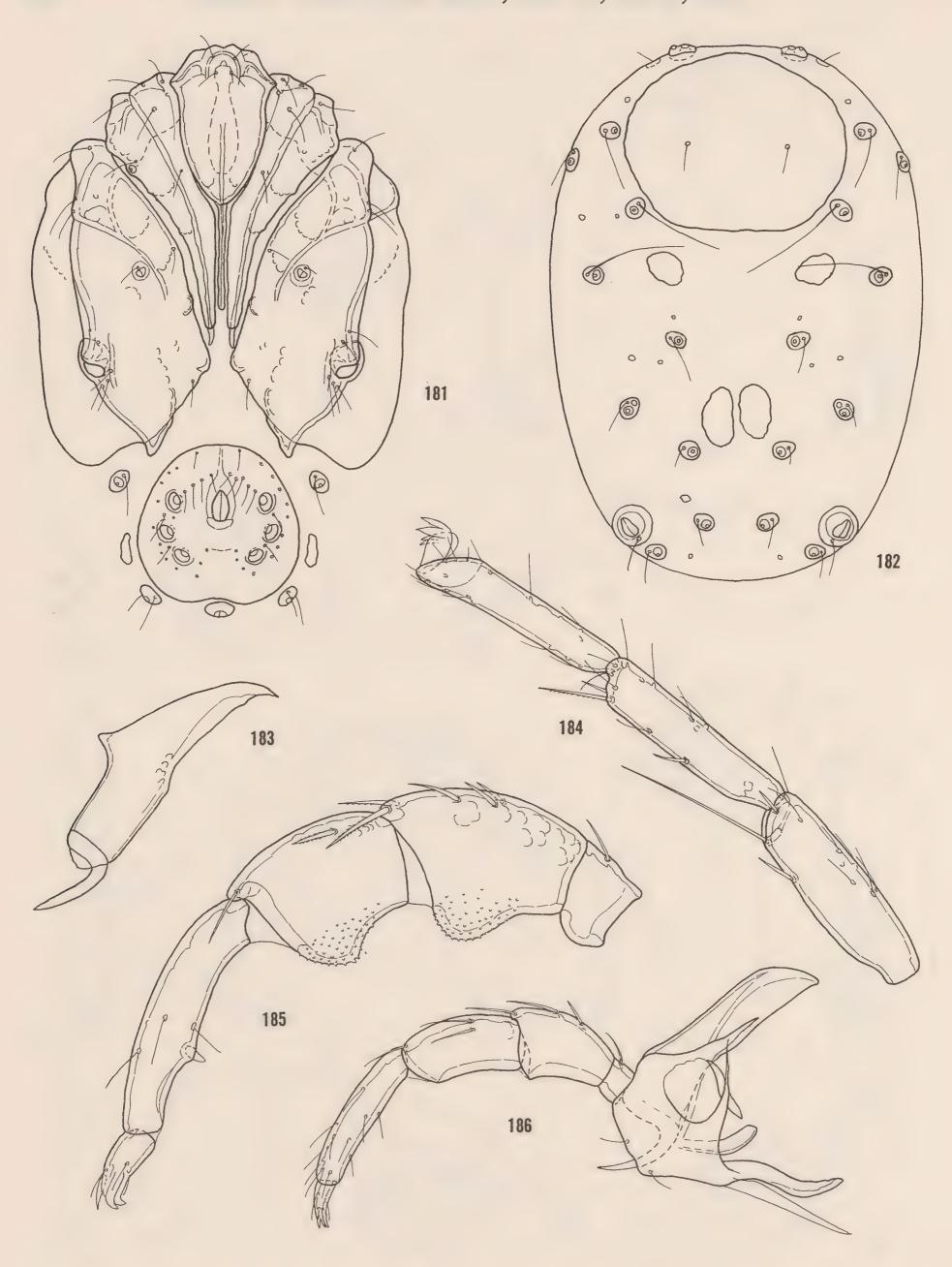
Australiobates setipalpis n. sp. Fig. 165, ventral sclerites, \$\parallel{\pa



Australiobates solomis n. sp. Fig. 170, ventral view, \$\partileq\$; Fig. 171, palp, \$\partial\$. Australiobates savanus n. sp. (Male) Fig. 172, distal segments of first leg; Fig. 173, ventral view; Fig. 174, palp.

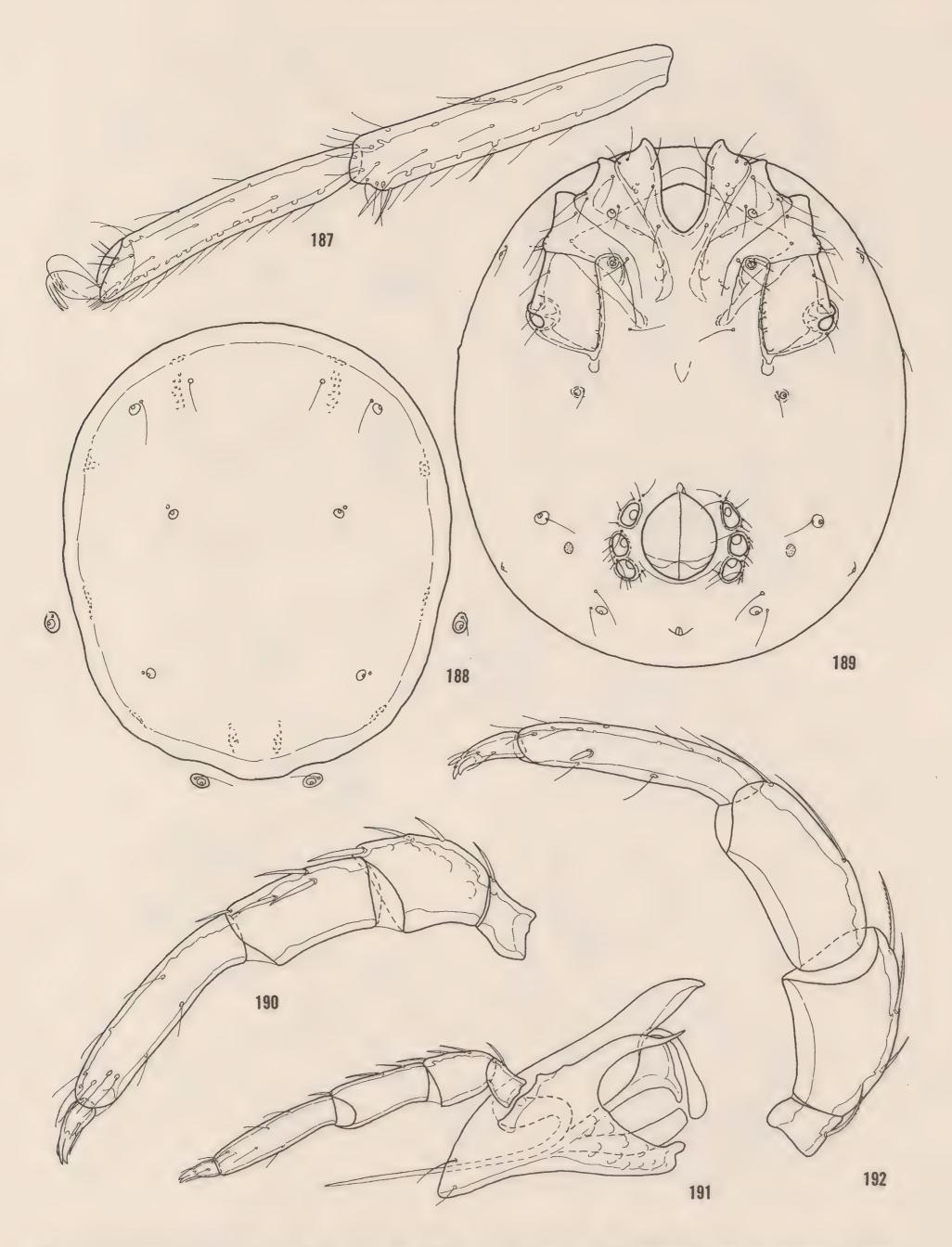


Hopkinsobates suzannae n. sp. Fig. 175, dorsal shield, \$\parphi\$; Fig. 176, distal segments of first leg, \$\parphi\$; Fig. 177, ventral shield, \$\sigma'\$; Fig. 178, lateral view of capitulum, chelicera and palp, \$\parphi\$; Fig. 179, ventral shield, \$\sigma'\$; Fig. 180, palp, \$\sigma'\$.



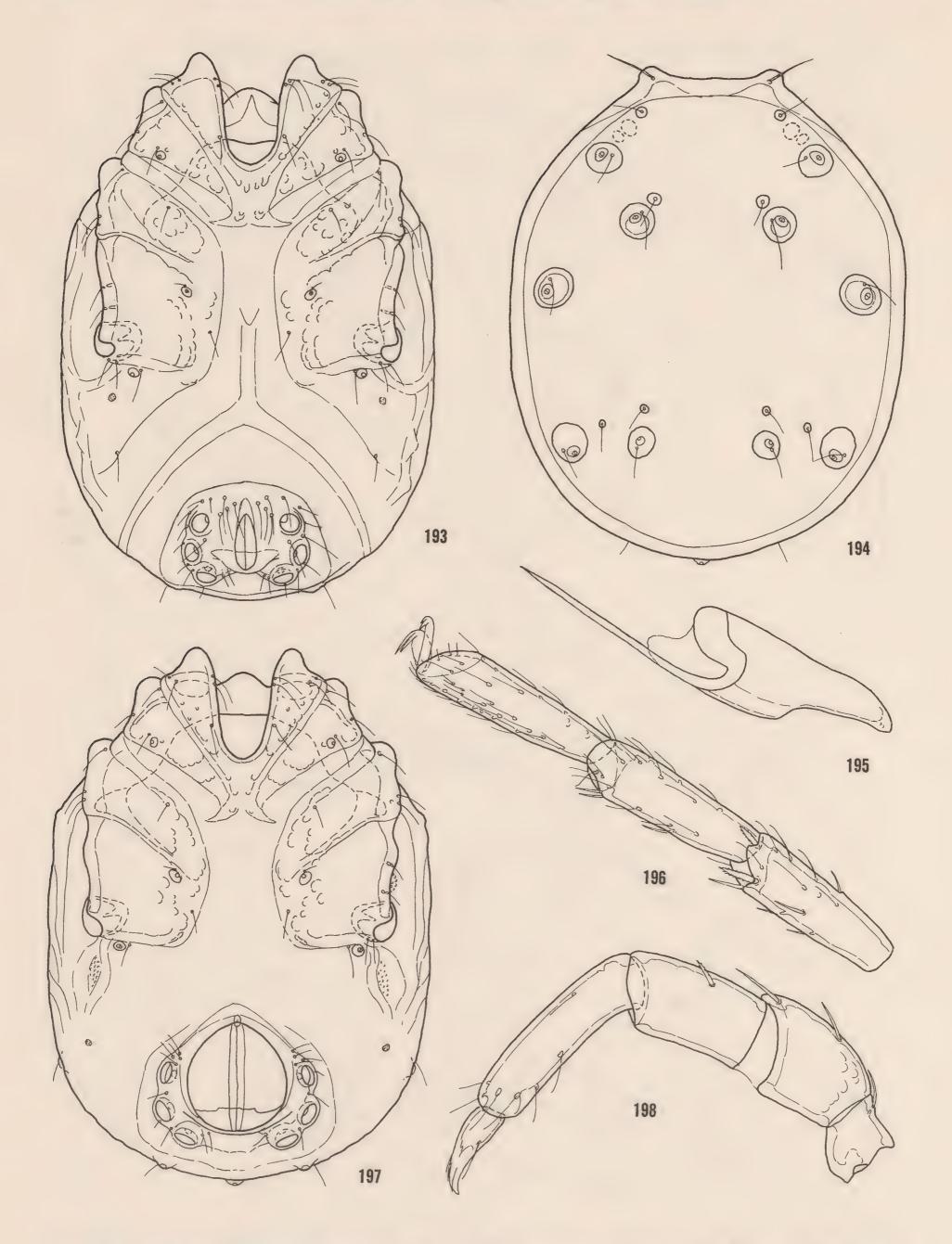
Notohygrobates kathrynae n. sp. (Male) Fig. 181, ventral sclerites; Fig. 182, dorsal view; Fig. 183, chelicera; Fig. 184, distal segments of first leg; Fig. 185, palp.

Aspidiobates orbiculatus Hopkins Fig. 186, lateral view of capitulum, chelicera and palp, φ .



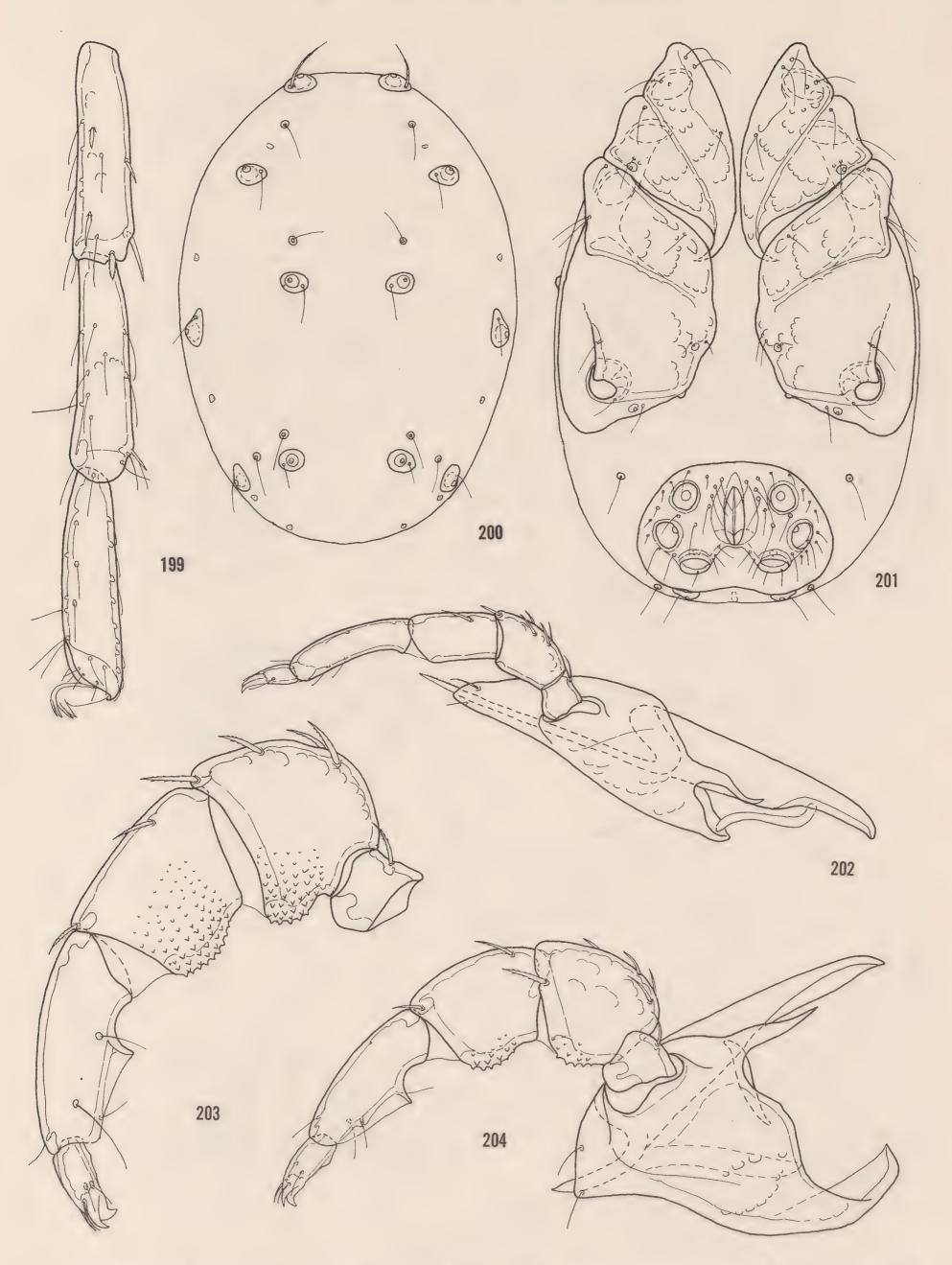
Aspidiobates orbiculatus Hopkins (Female) Fig. 187, distal segments of first leg; Fig. 188, dorsal shield; Fig. 189, ventral shield; Fig. 192, palp.

Aciculacarus papillosus Hopkins Fig. 190, palp, &; Fig. 191, lateral view of capitulum, chelicera and palp, \u2204.



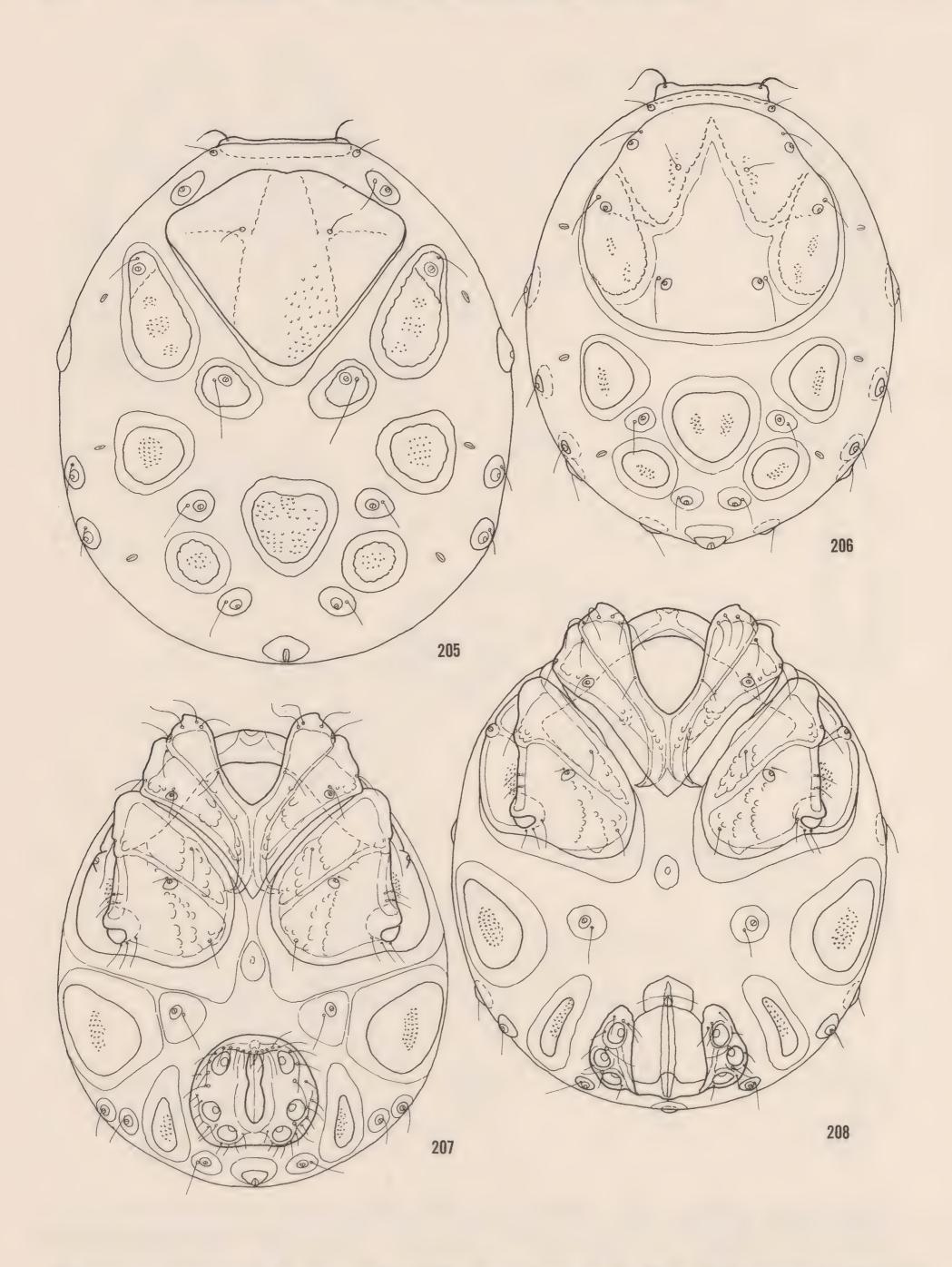
Aciculacarus papillosus Hopkins Fig. 193, ventral shield, o'; Fig. 194, dorsal view, \alphi; Fig. 195, chelicera, o'; Fig. 196, distal segments of first leg, \alphi; Fig. 197, ventral shield, \alpha.

Aciculacarus amalis n. sp. Fig. 198, palp, o.

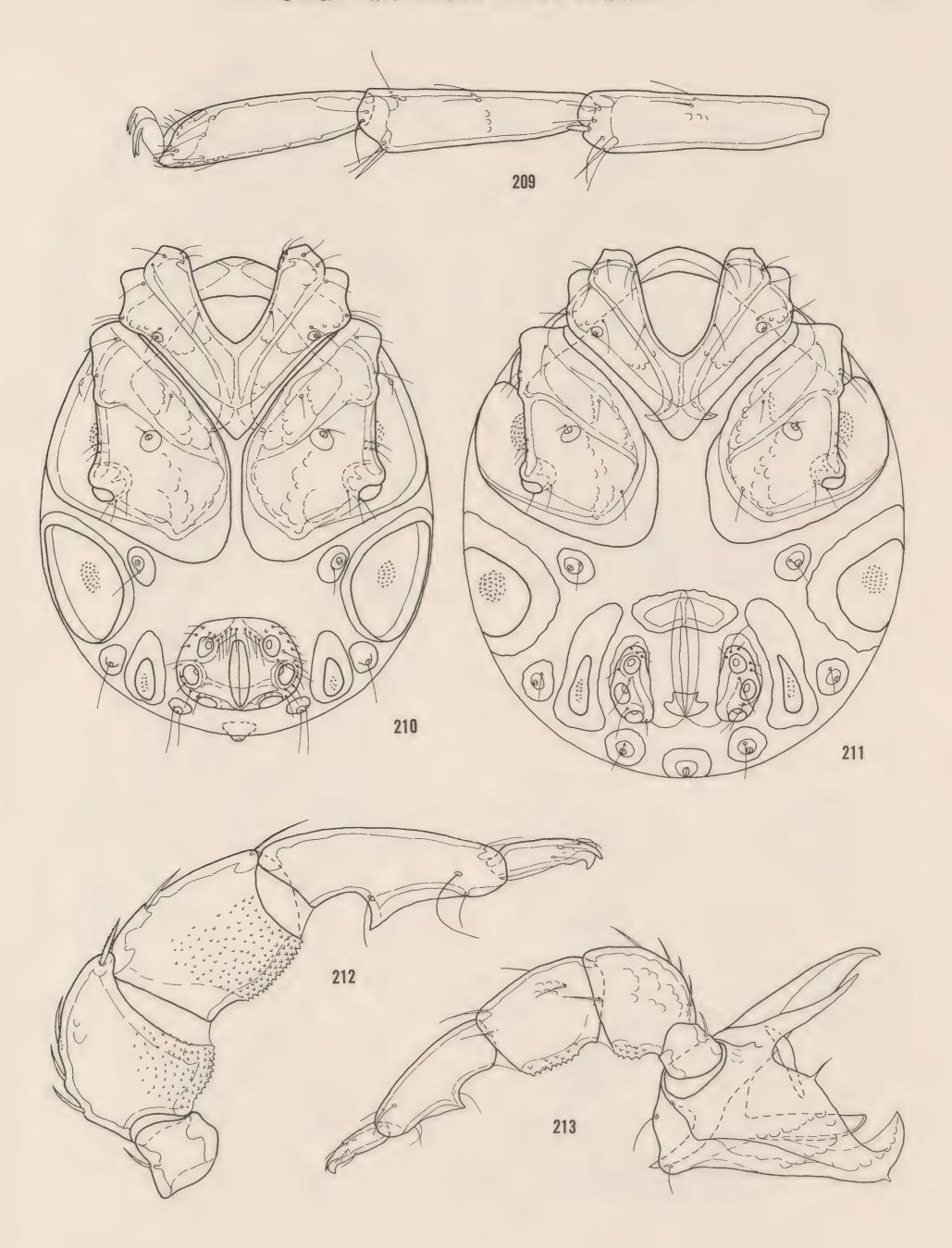


Aciculacarus amalis n. sp. (Male) Fig. 199, distal segments of first leg; Fig. 200, dorsal view; Fig. 201, ventral view; Fig. 202, lateral view of capitulum, chelicera and palp.

Zelandobates tornus n. sp. Fig. 203, palp, \(\partial\); Fig. 204, lateral view of capitulum, chelicera and palp, \(\sigma\).



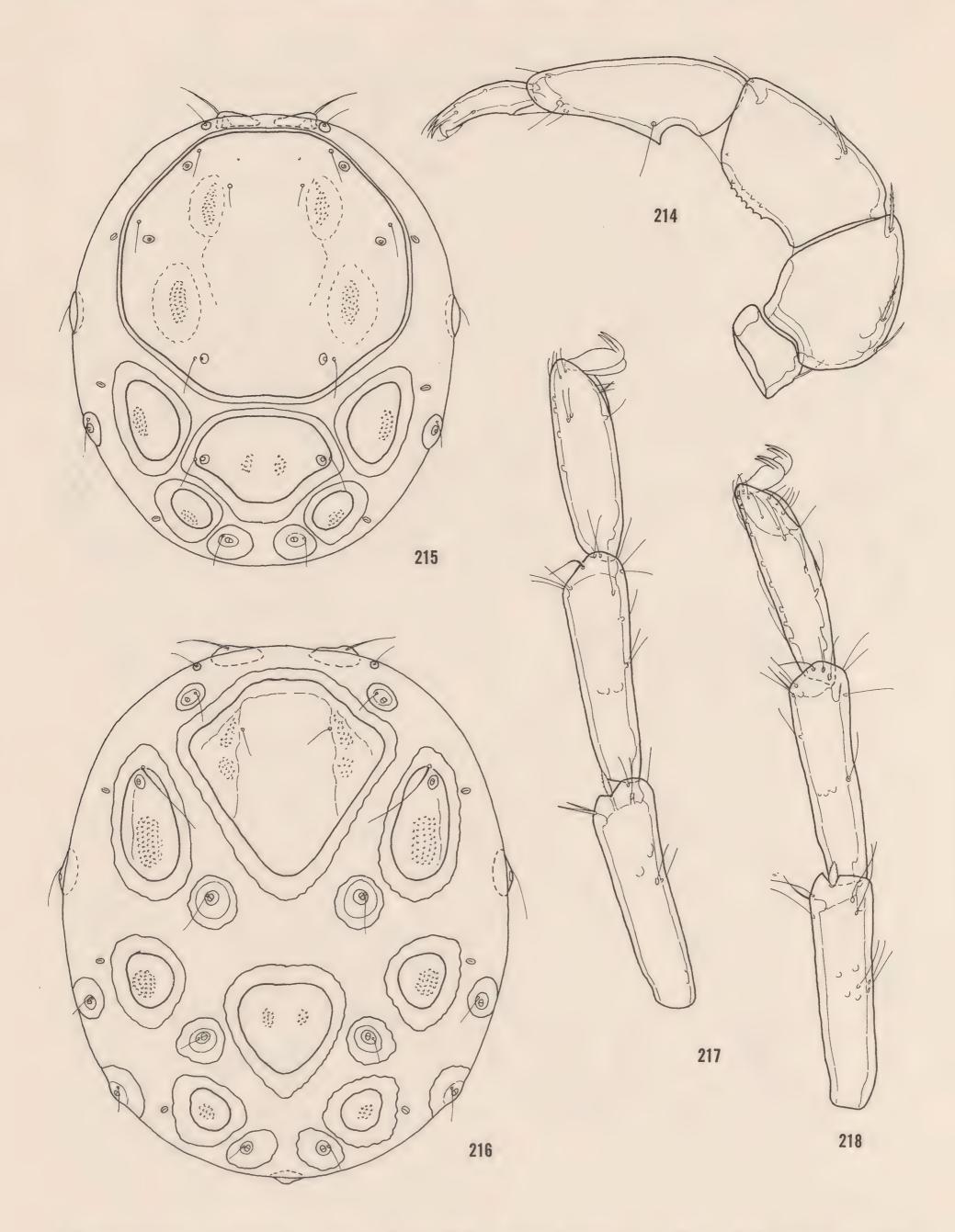
Zelandobates tornus n. sp. Fig. 205, dorsal view, \(\phi\); Fig. 206, dorsal view, \(\sigma\); Fig. 207, ventral view, \(\sigma\); Fig. 208, ventral view, \(\phi\).



Zelandobates tornus n. sp. Fig. 209, distal segments of first leg, φ.

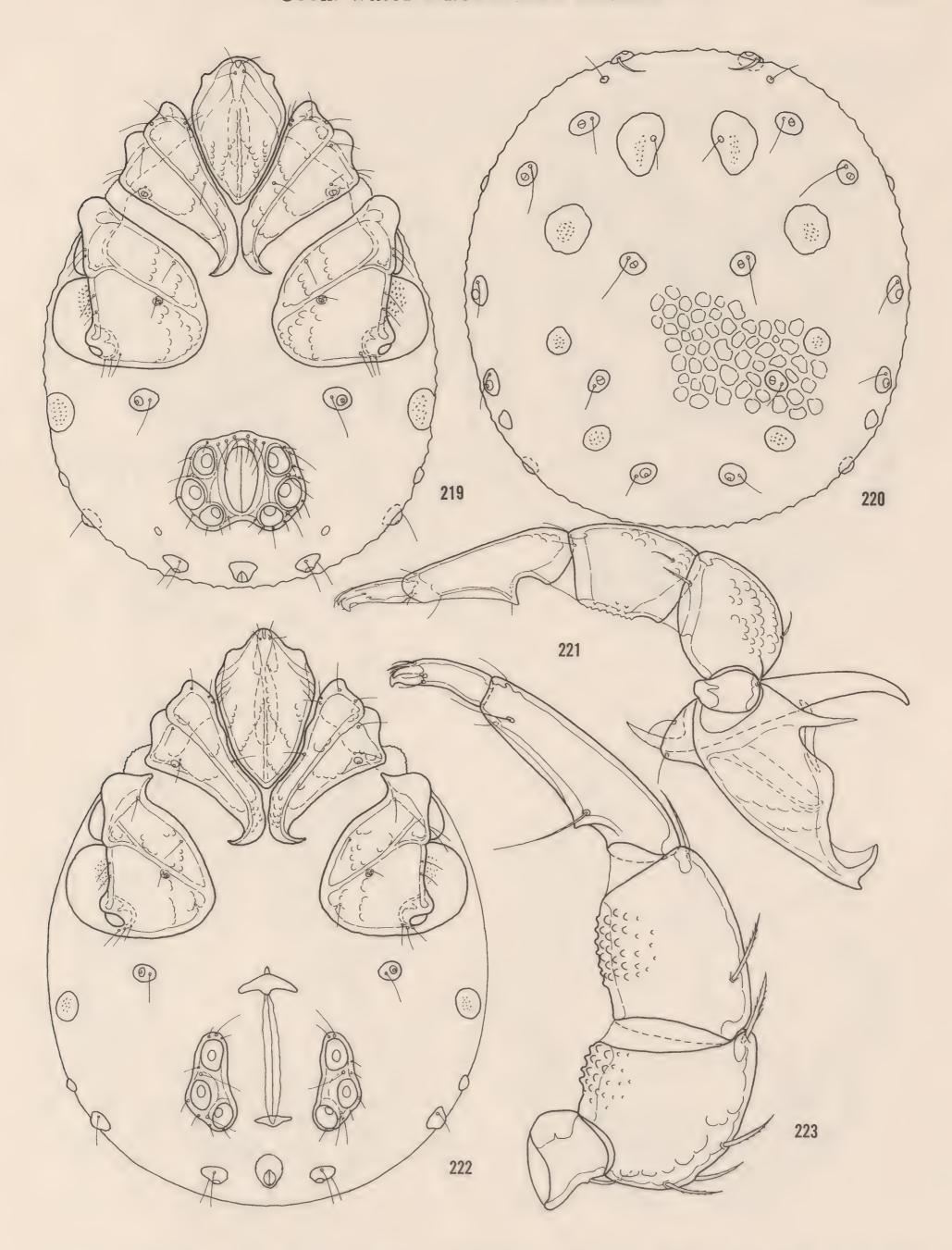
Zelandobates clevatus n. sp. Fig. 210, ventral view, σ; Fig. 211, ventral view,

φ; Fig. 212, palp, φ; Fig. 213, lateral view of capitulum, chelicera and palp, σ.

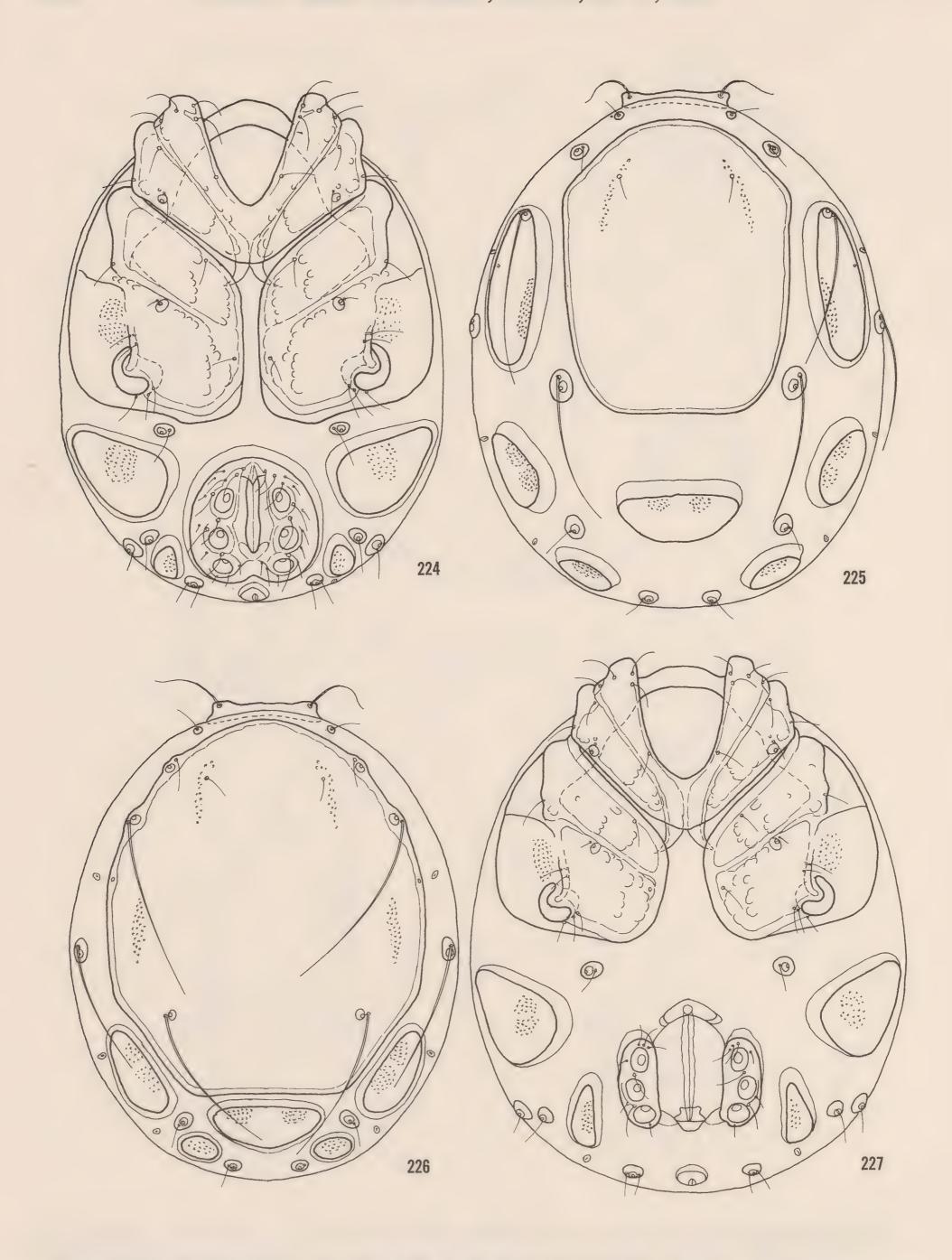


Zelandobates clevatus n. sp. Fig. 215, dorsal view, σ'; Fig. 216, dorsal view, φ; Fig. 218, distal segments of first leg, φ.

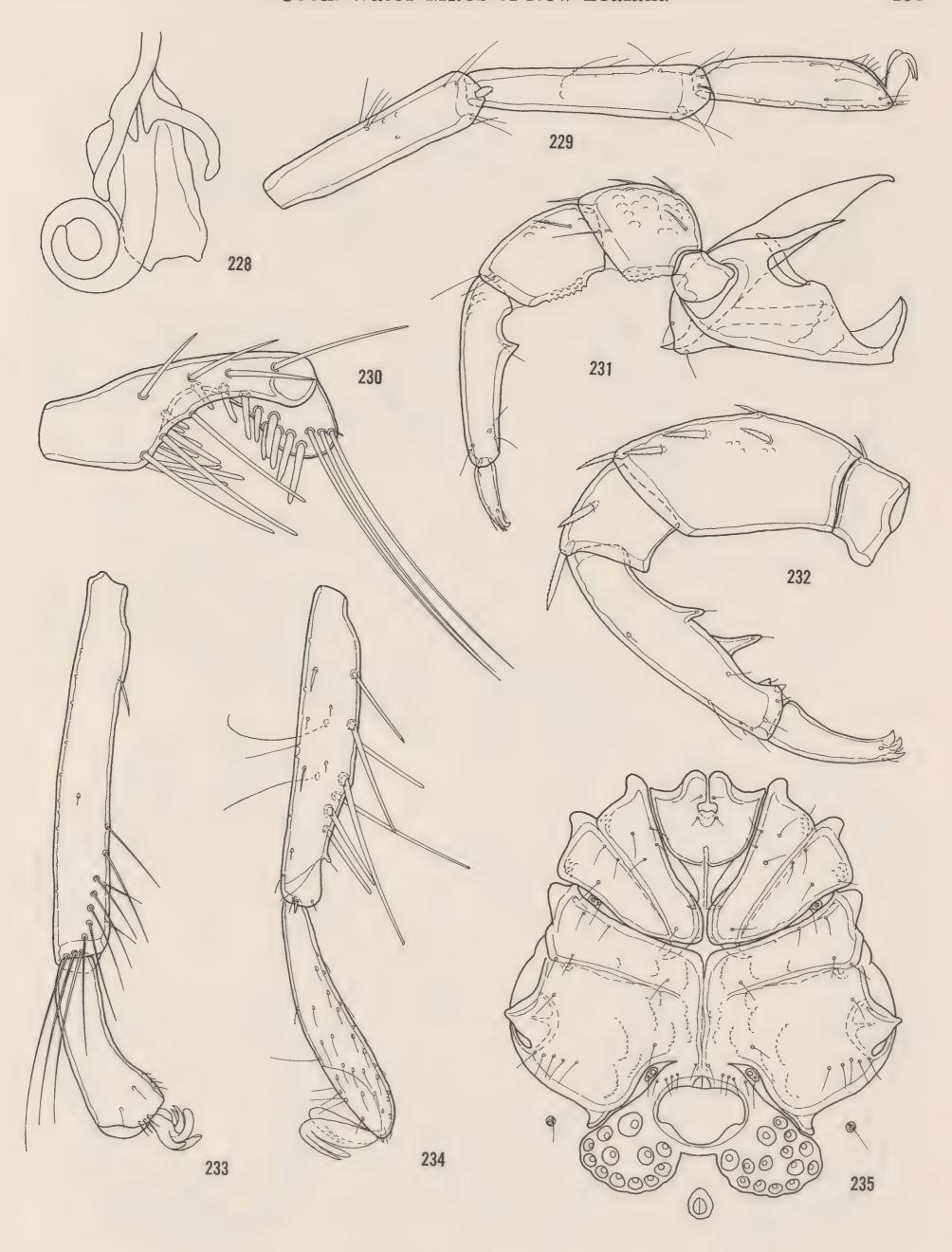
Zelandobatella naias Hopkins Fig. 214, palp, σ'; Fig. 217, distal segments of first leg, φ.



Zelandobatella naias Hopkins Fig. 219, ventral view, of; Fig. 220, dorsal view, of; Fig. 221, lateral view of capitulum, chelicera and palp, of; Fig. 222, ventral view, of; Fig. 222, ventral view, of; Fig. 223, palp, of.

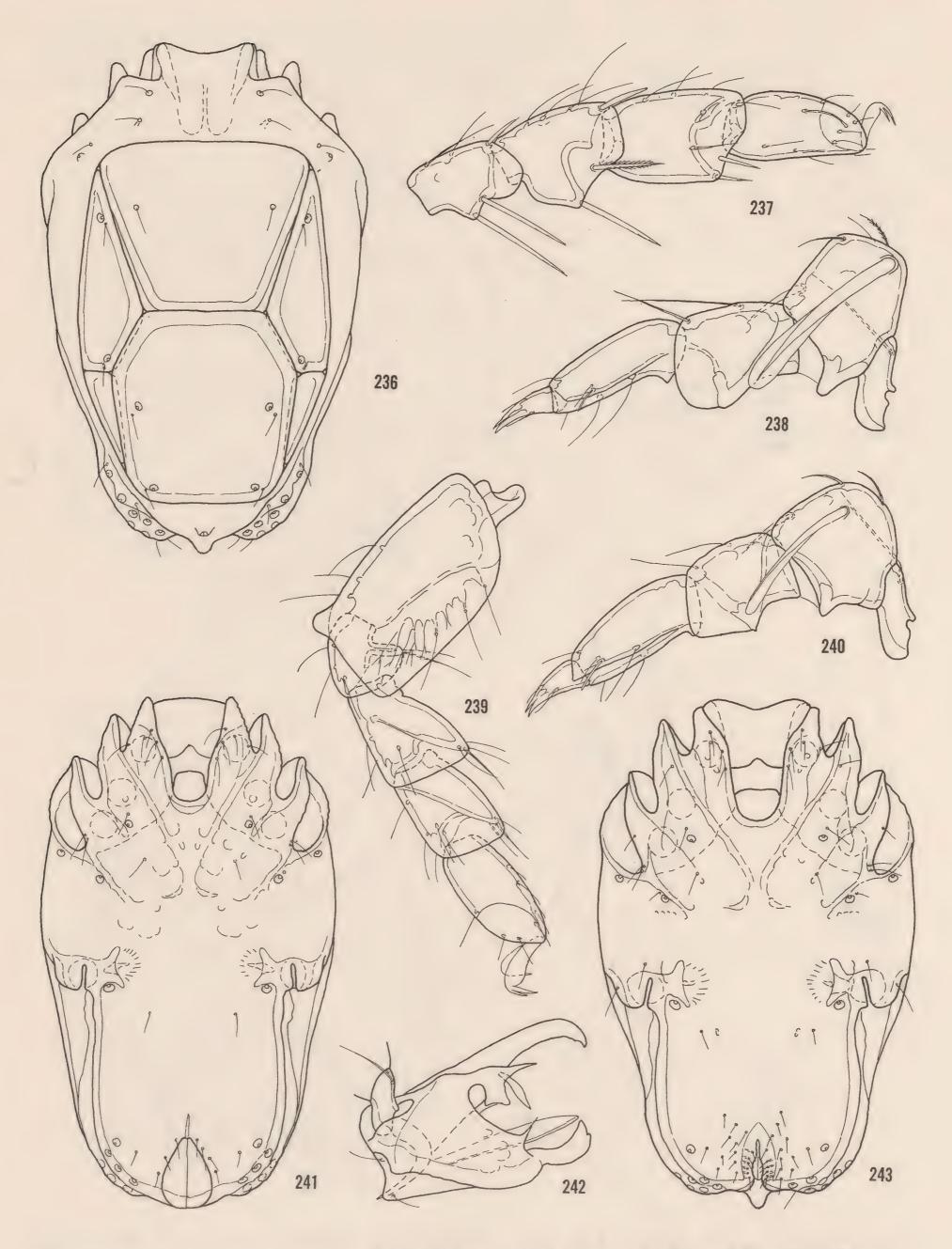


Zelandobates crinitus Hopkins Fig. 224, ventral view, ♂; Fig. 225, dorsal view, ♀; Fig. 226, dorsal view, ♂; Fig. 227, ventral view, ♀.

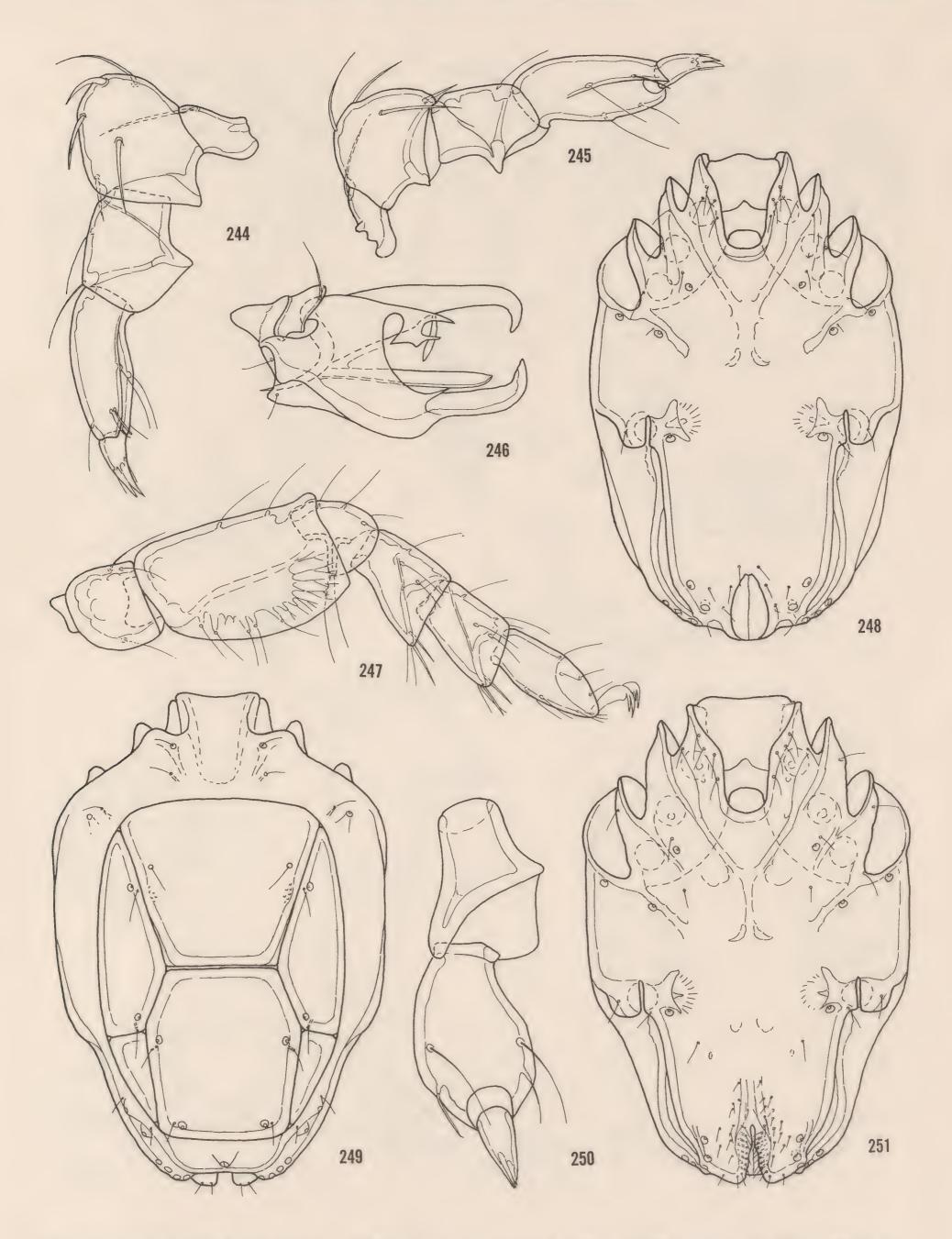


Piona exigua Viets (Male) Fig. 228, ejaculatory complex; Fig. 230, IV-Leg-4; Fig. 232, palp; Fig. 233, III-Leg-5 and 6; Fig. 234, I-Leg-5 and 6; Fig. 235, ventral sclerites.

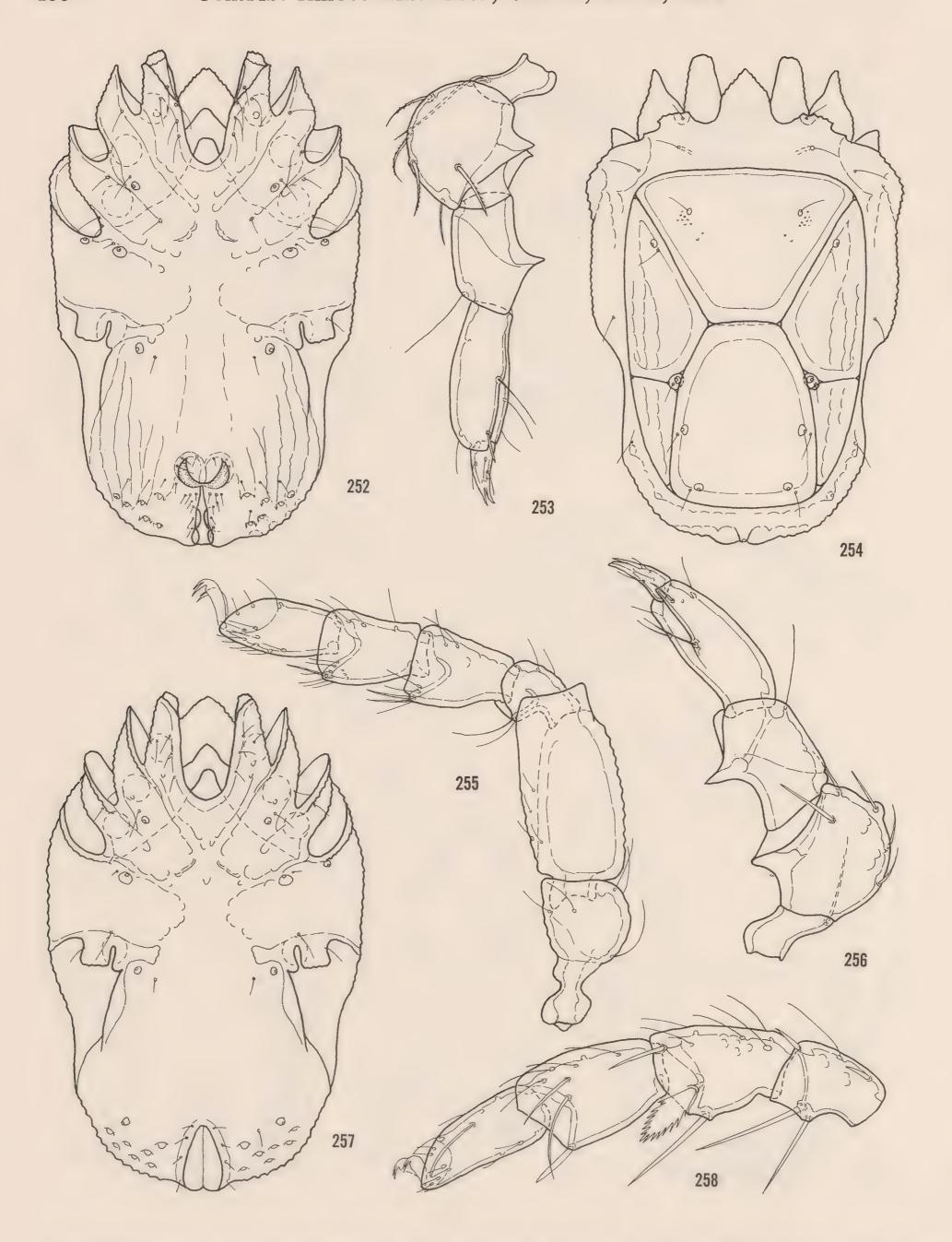
Zelandobates crinitus Hopkins Fig. 229, distal segments of first leg, φ ; Fig. 231, lateral view of capitulum, chelicera and palp, φ .



Planaturus setipalpis n. sp. Fig. 236, dorsal view, o'; Fig. 237, distal segments of first leg, \(\phi\); Fig. 238, palp, o'; Fig. 239, fourth leg, o'; Fig. 240, palp, \(\phi\); Fig. 241, ventral shield, \(\phi\); Fig. 242, capitulum, \(\phi\); Fig. 243, ventral shield, o'.

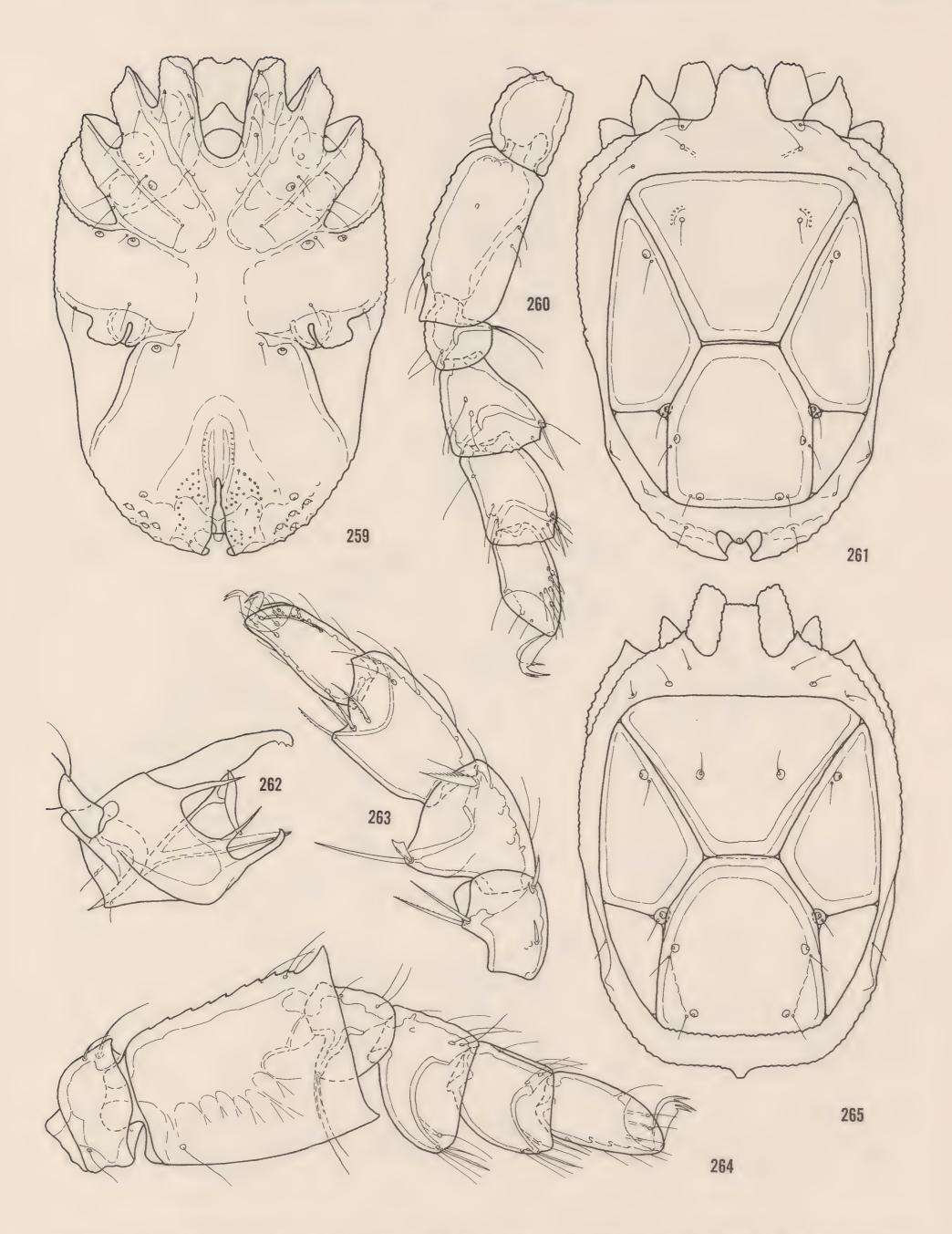


Planaturus lundbladi n. sp. Fig. 244, palp, o'; Fig. 245, palp, \(\varphi\); Fig. 246, capitulum, o'; Fig. 247, fourth leg, o'; Fig. 248, ventral shield, \(\varphi\); Fig. 249, dorsal view, o'; Fig. 250, ventral view of P-III through V, o'; Fig. 251, ventral shield, o'.



Taintaturus abditus n. sp. Fig. 252, ventral shield, o'; Fig. 253, palp, o'; Fig. 254, dorsal view, o'; Fig. 255, fourth leg, o'; Fig. 257, ventral view, o'; Fig. 258, distal segments of first leg, o'.

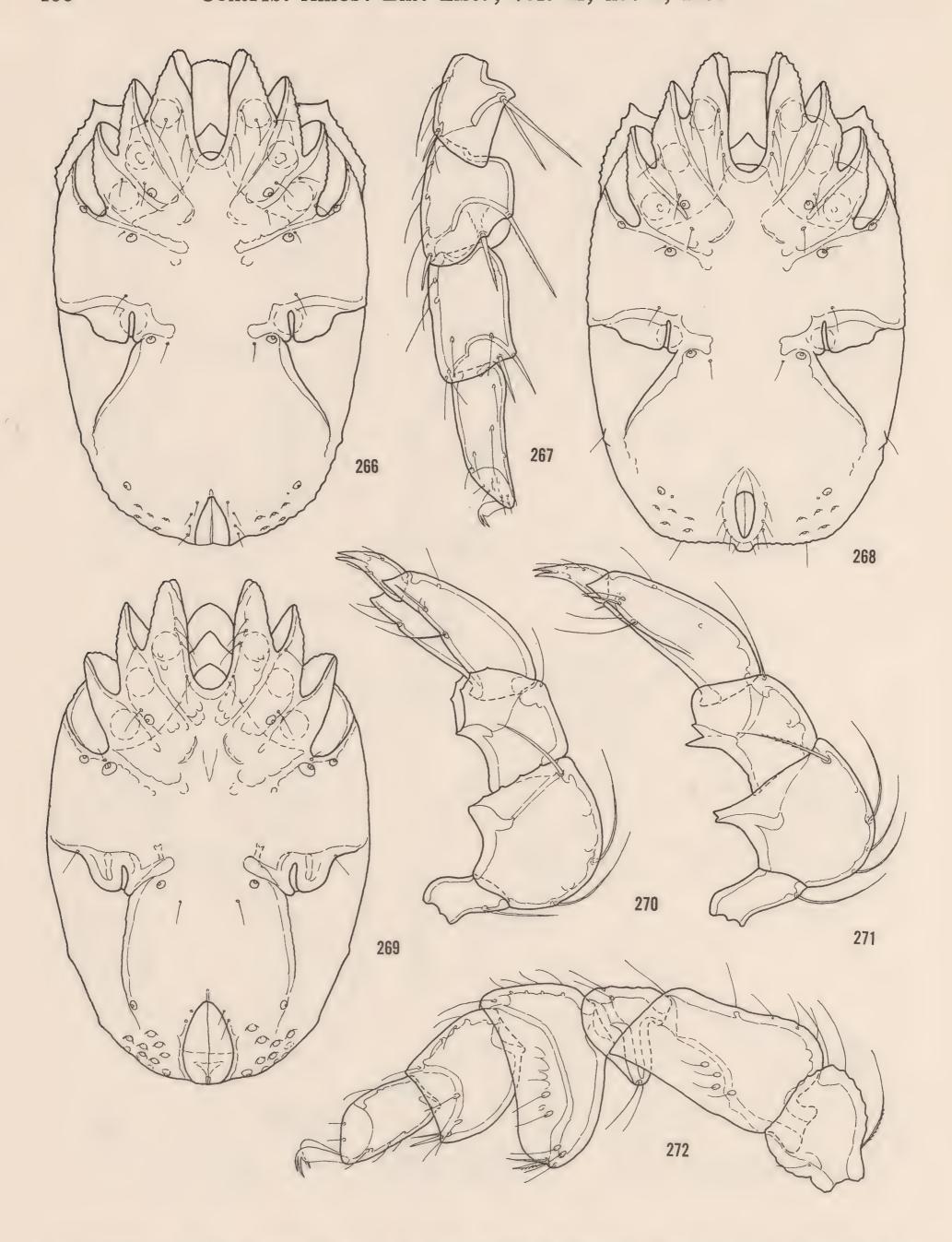
Taintaturus accidens n. sp. Fig. 256, palp, o'.

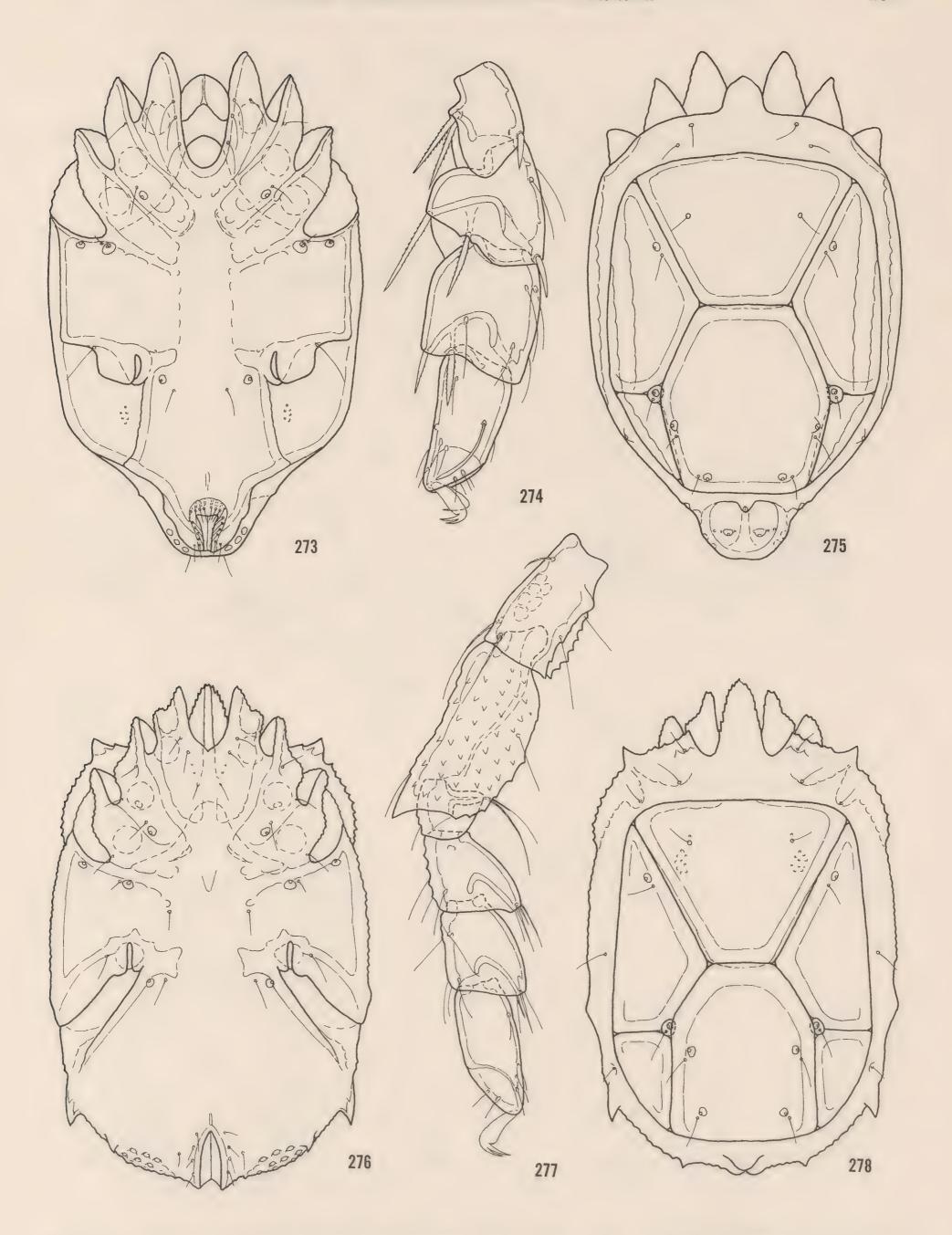


Taintaturus accidens n. sp. Fig. 259, ventral shield, o'; Fig. 260, fourth leg, o'; Fig. 261, dorsal view, o'; Fig. 263, distal segments of first leg, o'.

Taintaturus hopkinsi n. sp. Fig. 262, capitulum, o'; Fig. 264, fourth leg, o';

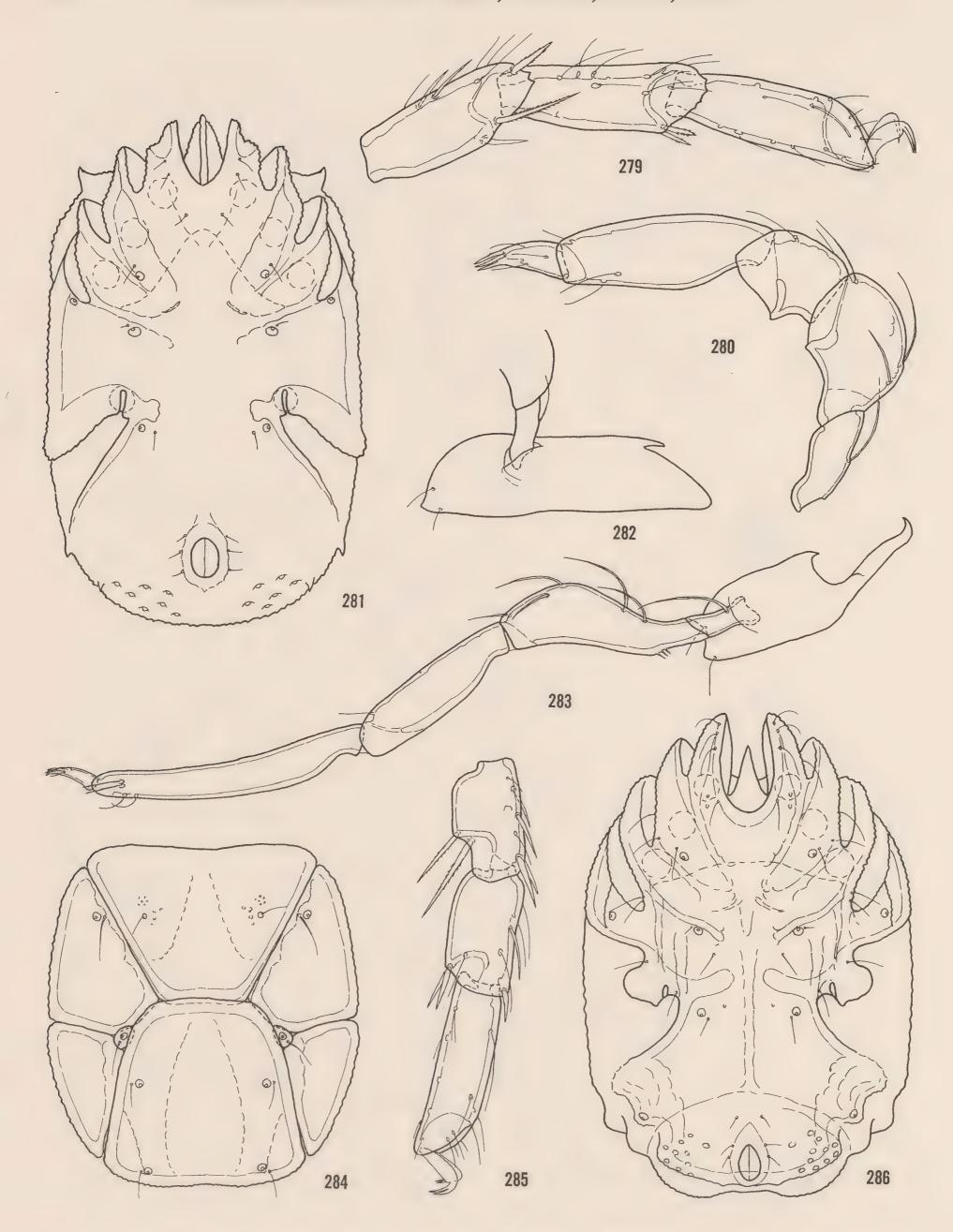
Fig. 265, dorsal view, o'.





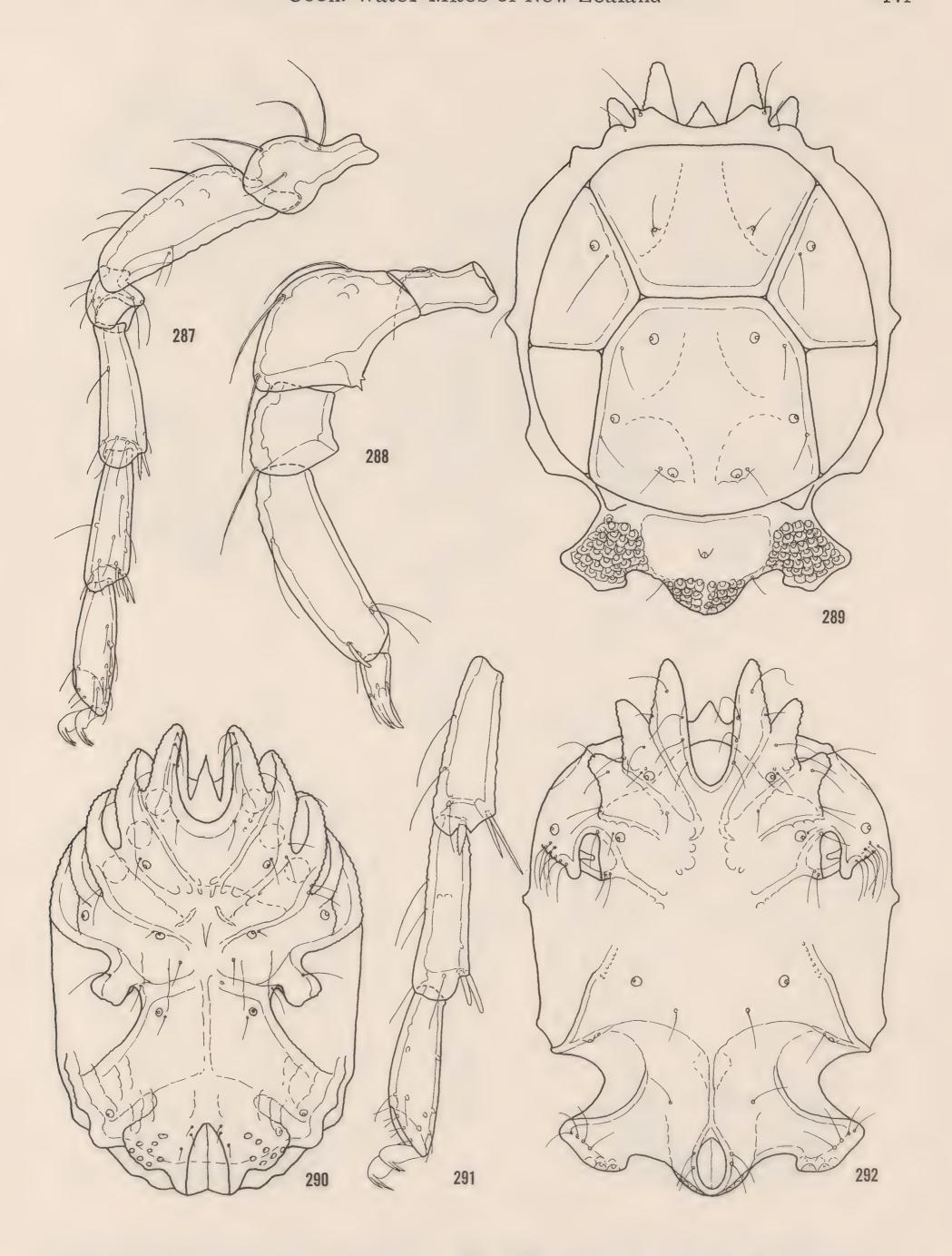
Taintaturus projectus n. sp. Fig. 273, ventral shield, &; Fig. 274, distal segments of first leg, &; Fig. 275, dorsal view, &.

Abelaturus cornophorus n. sp. Fig. 276, ventral shield, &; Fig. 277, fourth leg, &; Fig. 278, dorsal view, &.

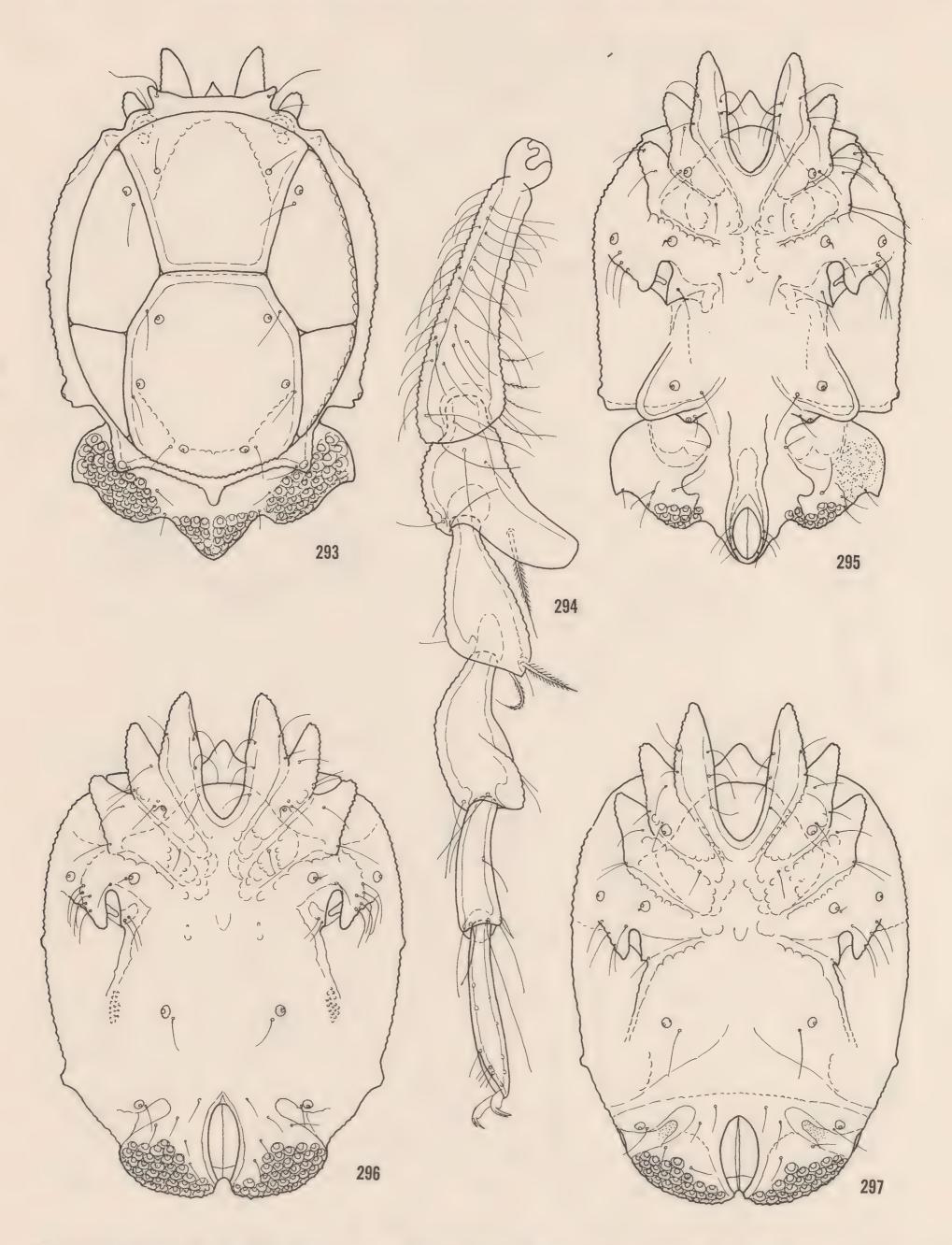


Omegaturus longipalpis n. sp. Fig. 279, distal segments of first leg, \(\varphi\); Fig. 283, lateral view of capitulum and palp, \(\varphi\); Fig. 284, dorsal shield, \(\sigma\)'; Fig. 286, ventral view, \(\sigma\)'.

Abelaturus cornophorus n. sp. Fig. 280, palp, \cong Fig. 281, ventral shield, \cong ; Fig. 282, capitulum, \cong Fig. 285, distal segments of first leg, \cong .

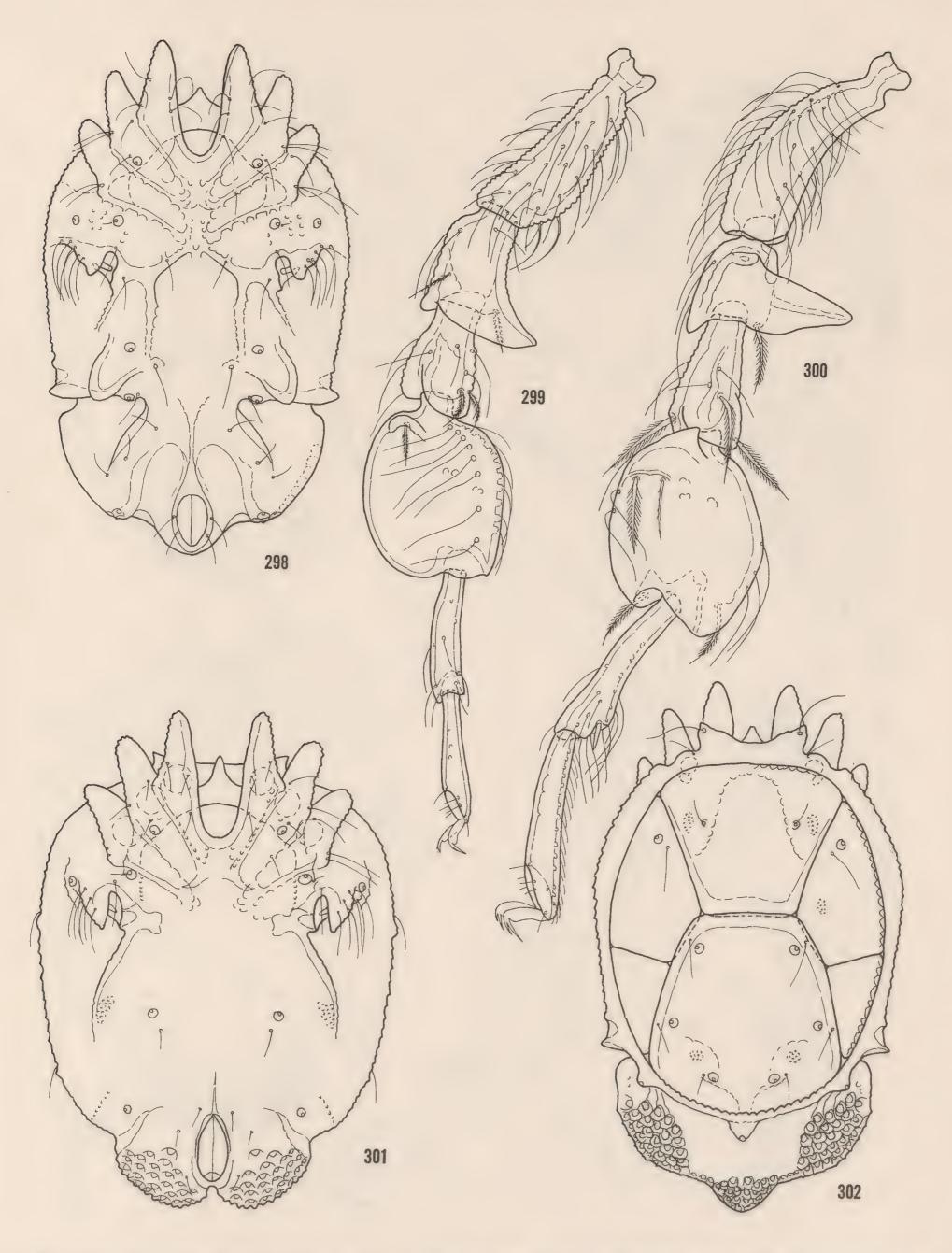


Omegaturus longipalpis n. sp. Fig. 287, fourth leg, &; Fig. 290, ventral view, \(\frac{1}{2} \). Tryssaturopsis asopos n. sp. Fig. 288, palp, \(\frac{1}{2} \); Fig. 289, dorsal view, \(\frac{1}{2} \); Fig. 291, distal segments of first leg, \(\frac{1}{2} \); Fig. 292, ventral shield, \(\frac{1}{2} \).



Tryssaturopsis novus (Hopkins) Fig. 293, dorsal view, o; Fig. 295, ventral shield, o; Fig. 297, ventral shield, \(\varphi\).

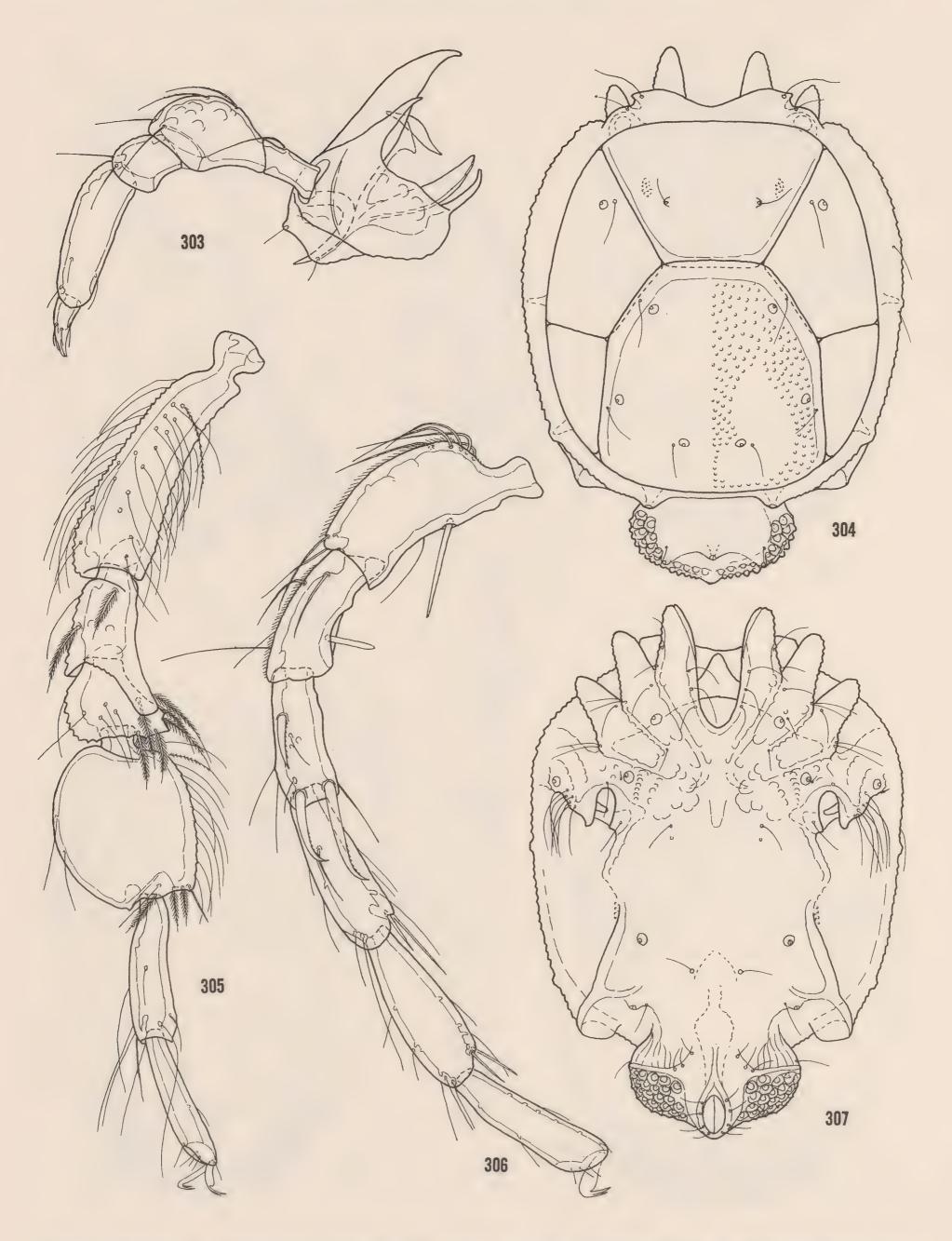
Tryssaturopsis asopos n. sp. Fig. 294, fourth leg, o; Fig. 296, ventral shield, \(\varphi\).



Tryssaturopsis solivagus n. sp. Fig. 298, ventral shield, o'; Fig. 299, fourth leg, o'; Fig. 302, dorsal view, o'.

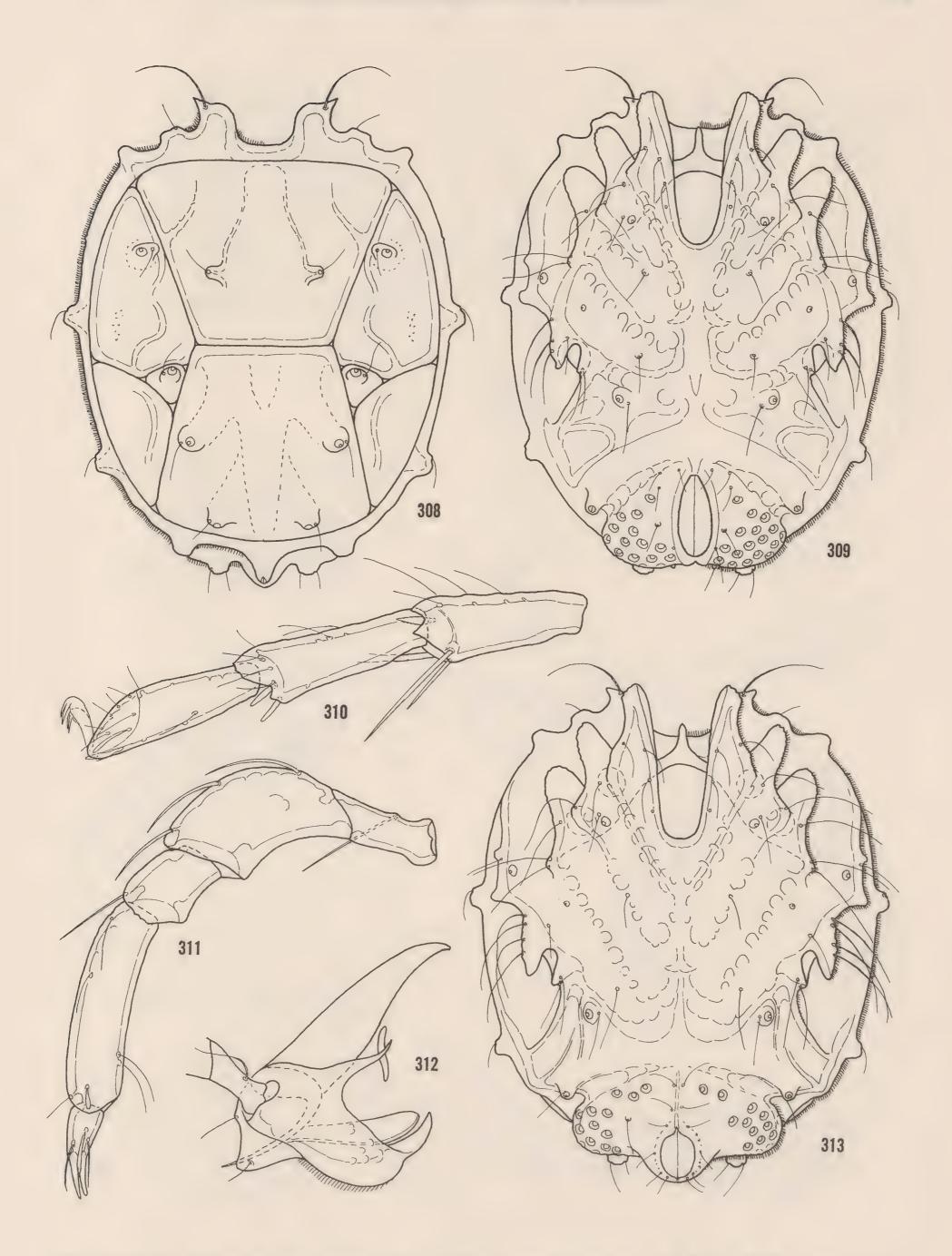
Tryssaturopsis novus (Hopkins) Fig. 300, fourth leg, o.

Tryssaturopsis parvicaudatus n. sp. Fig. 301, ventral shield, \cong .

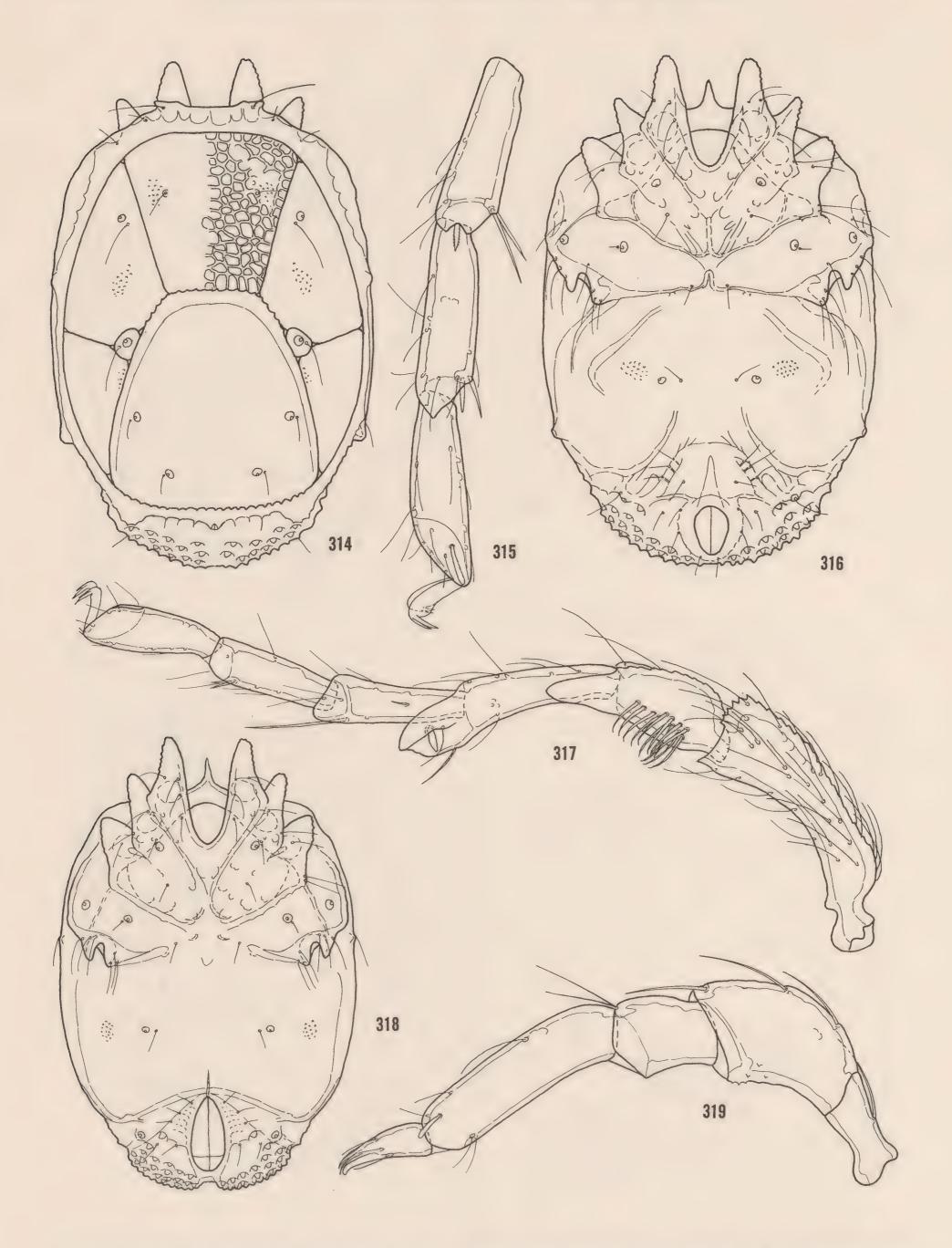


Tryssaturopsis parvicaudatus n. sp. Fig. 303, lateral view of capitulum, chelicera and palp, \$\Pi\$; Fig. 304, dorsal view, \$\sigma\$; Fig. 305, fourth leg, \$\sigma\$; Fig. 307, ventral shield, \$\sigma\$.

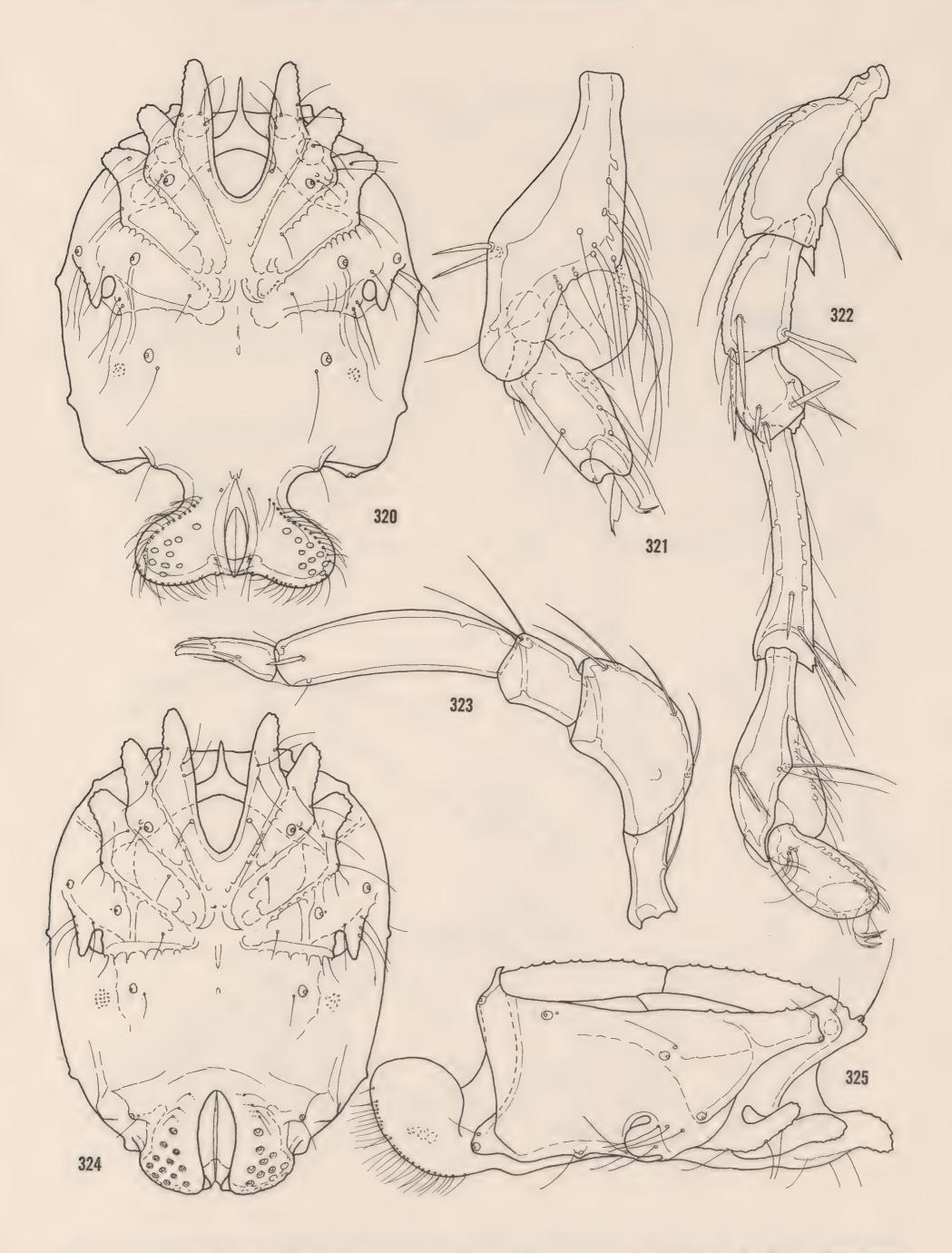
Pilosaturus villosus (Hopkins) Fig. 306, fourth leg, \$\sigma\$.



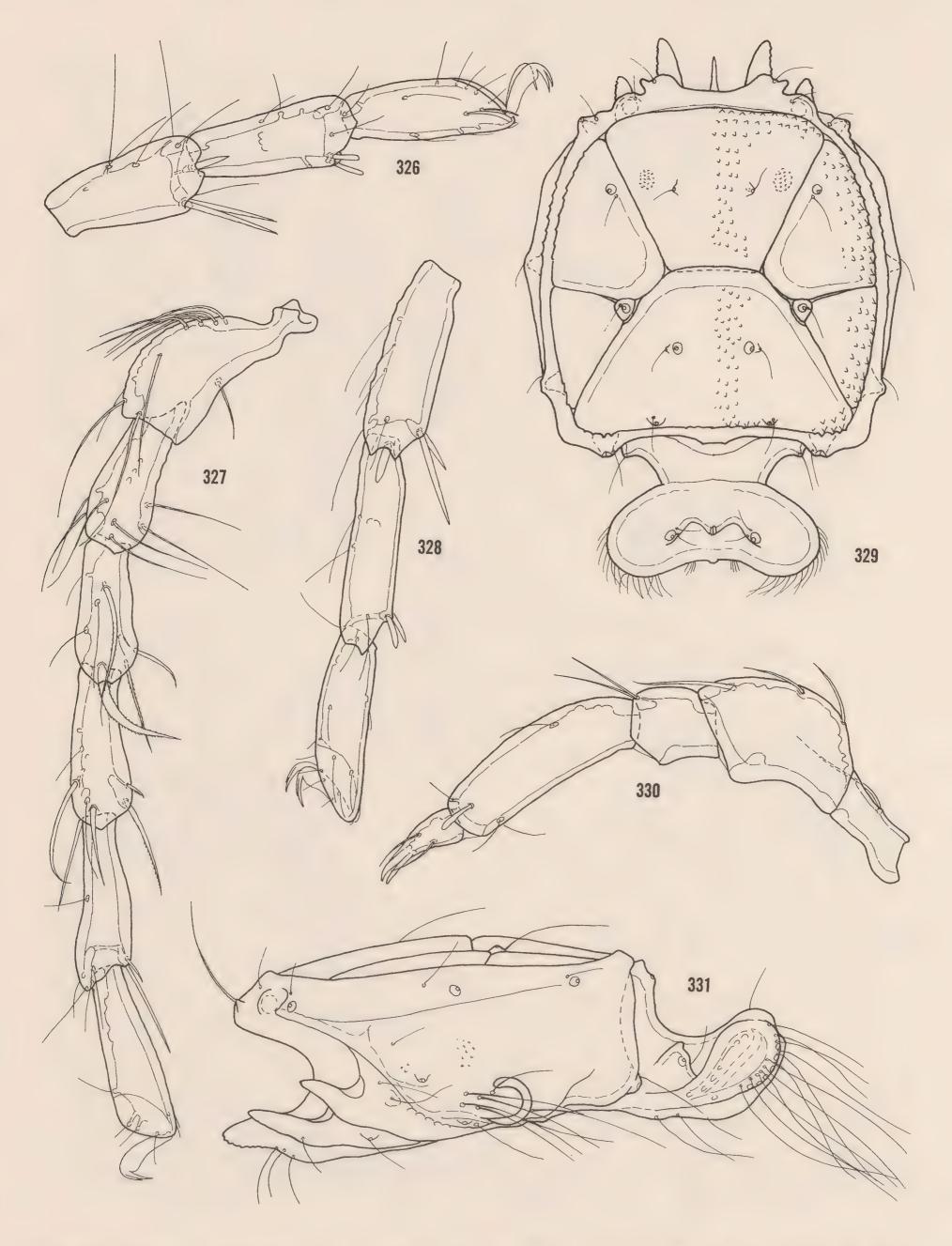
Pilosaturus villosus (Hopkins) Fig. 308, dorsal view, σ ; Fig. 309, ventral shield, φ ; Fig. 310, distal segments of first leg, φ ; Fig. 311, palp, φ ; Fig. 312, capitulum, φ ; Fig. 313, ventral shield, σ .



Tryssaturus spinipes Hopkins Fig. 314, dorsal view, o; Fig. 315, distal segments of first leg, φ ; Fig. 316, ventral shield, o; Fig. 317, fourth leg, o; Fig. 318, ventral shield, φ ; Fig. 319, palp, φ .

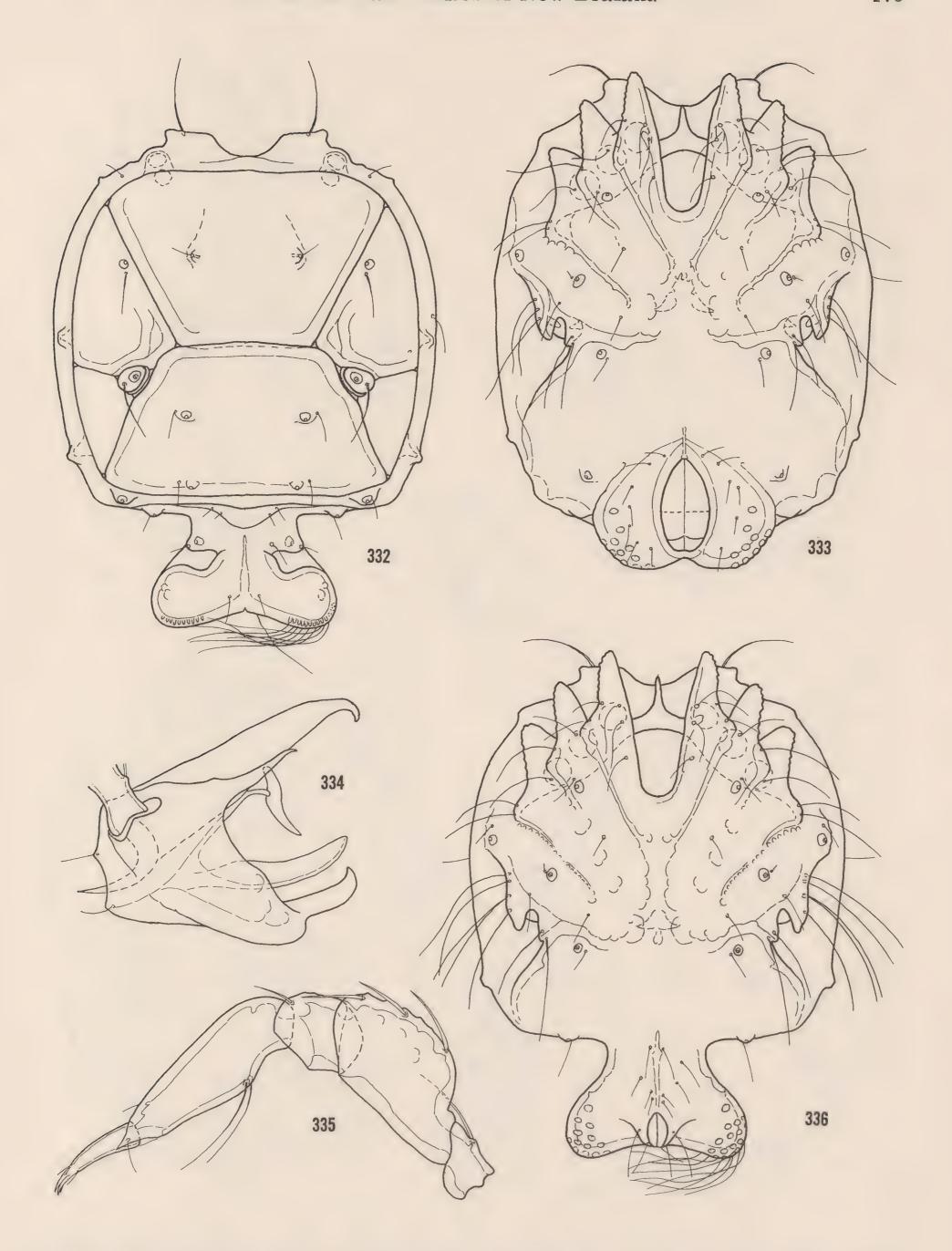


Neotryssaturus inusitatus (Hopkins) Fig. 320, ventral shield, σ ; Fig. 321, IV-Leg-5 and 6, σ ; Fig. 322, fourth leg, σ ; Fig. 323, palp, φ ; Fig. 324, ventral shield, φ ; Fig. 325, lateral view, σ .

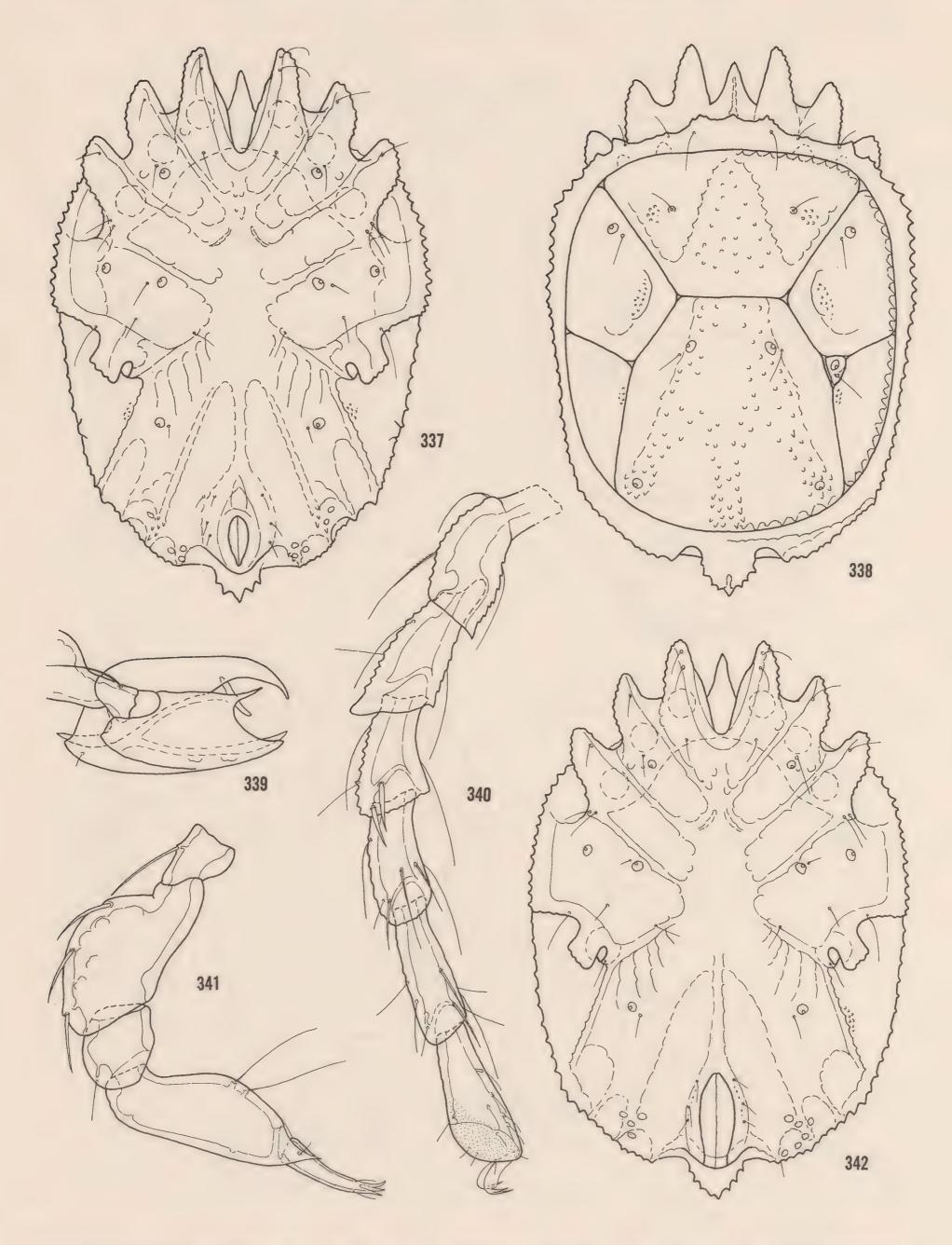


Neotryssaturus pallidus n. sp. Fig. 326, distal segments of first leg, \$\partial\$; Fig. 327, fourth leg, \$\sigma\$; Fig. 330, palp, \$\partial\$; Fig. 331, lateral view, \$\sigma\$.

Neotryssaturus inusitatus (Hopkins) Fig. 328, distal segments of first leg, \$\partial\$; Fig. 329, dorsal view, \$\sigma\$.

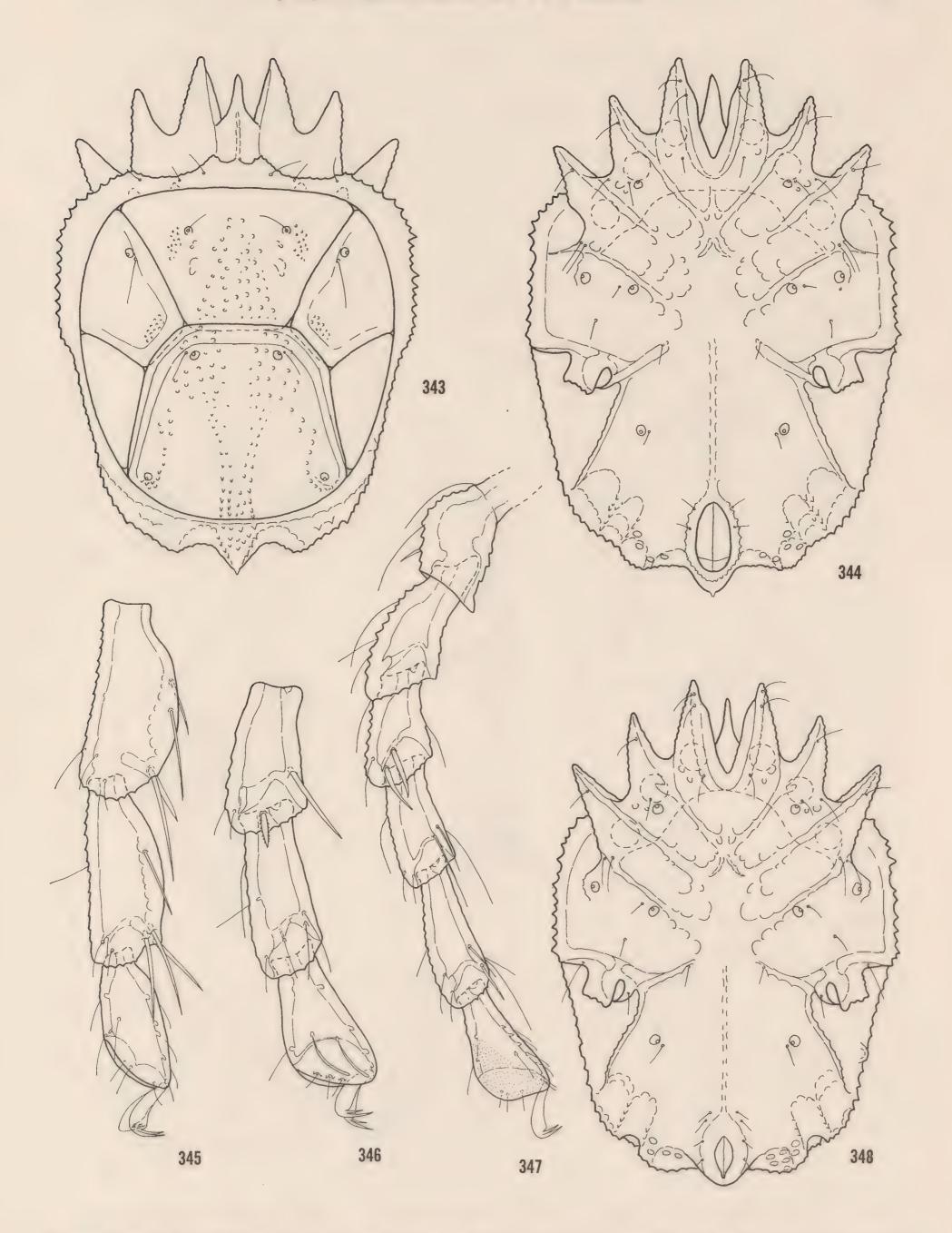


Neotryssaturus pallidus n. sp. Fig. 332, dorsal view, &; Fig. 333, ventral shield, &; Fig. 334, capitulum, &; Fig. 336, ventral shield, &. Evidaturus exilis n. sp. Fig. 335, palp, &.



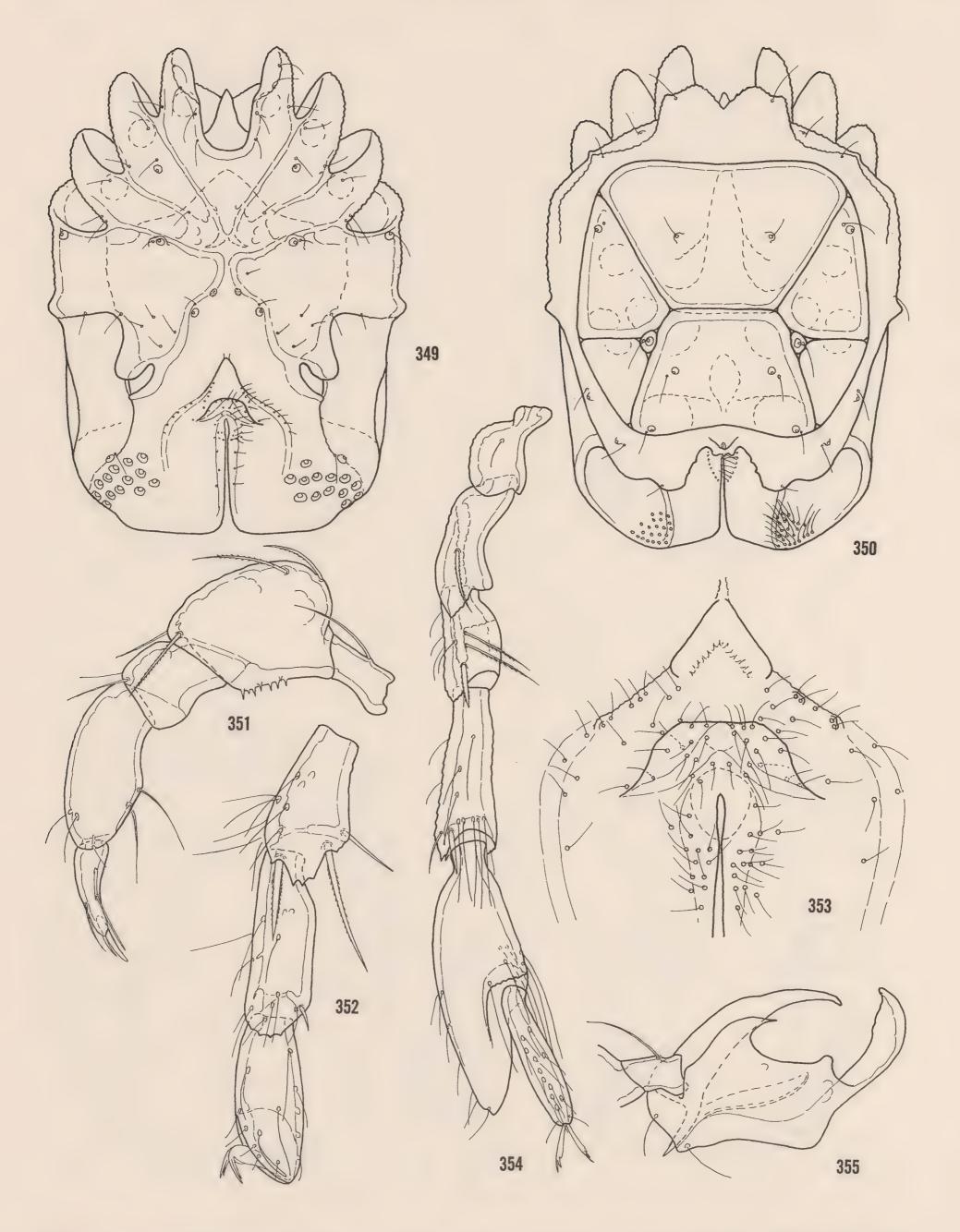
Evidaturus exilis n. sp. Fig. 337, ventral shield, σ ; Fig. 338, dorsal view, φ ; Fig. 340, fourth leg, σ ; Fig. 342, ventral shield, φ .

Evidaturus scopticus n. sp. Fig. 339, capitulum and chelicera, σ ; Fig. 341, palp, φ .

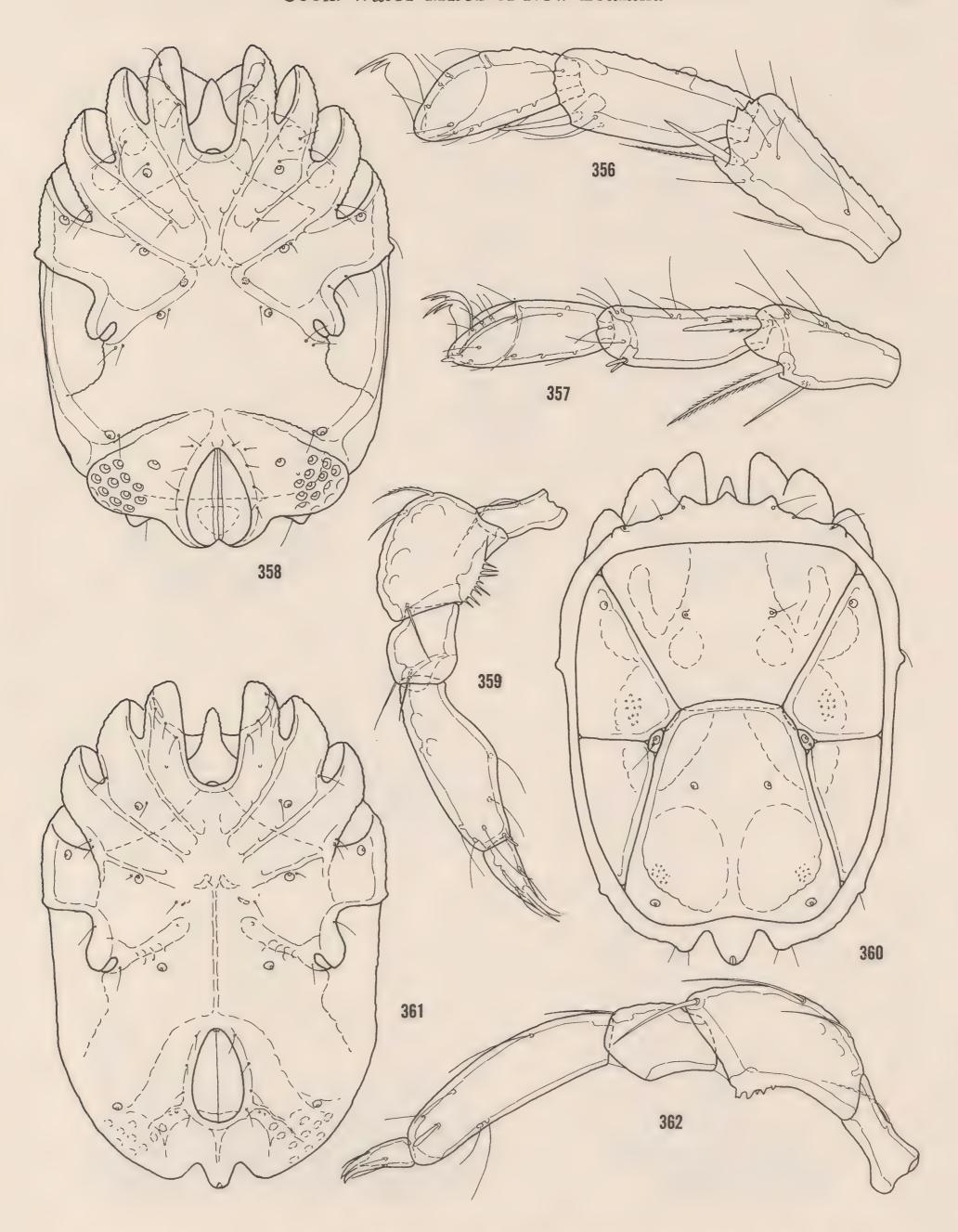


Evidaturus scopticus n. sp. Fig. 343, dorsal view, o'; Fig. 344, ventral shield, \(\varphi\); Fig. 346, distal segments of first leg, \(\varphi\); Fig. 347, fourth leg, o'; Fig. 348, ventral shield, o'.

Piotaturus alvecaudatus n. sp. Fig. 345, distal segments of fourth leg, \cong .

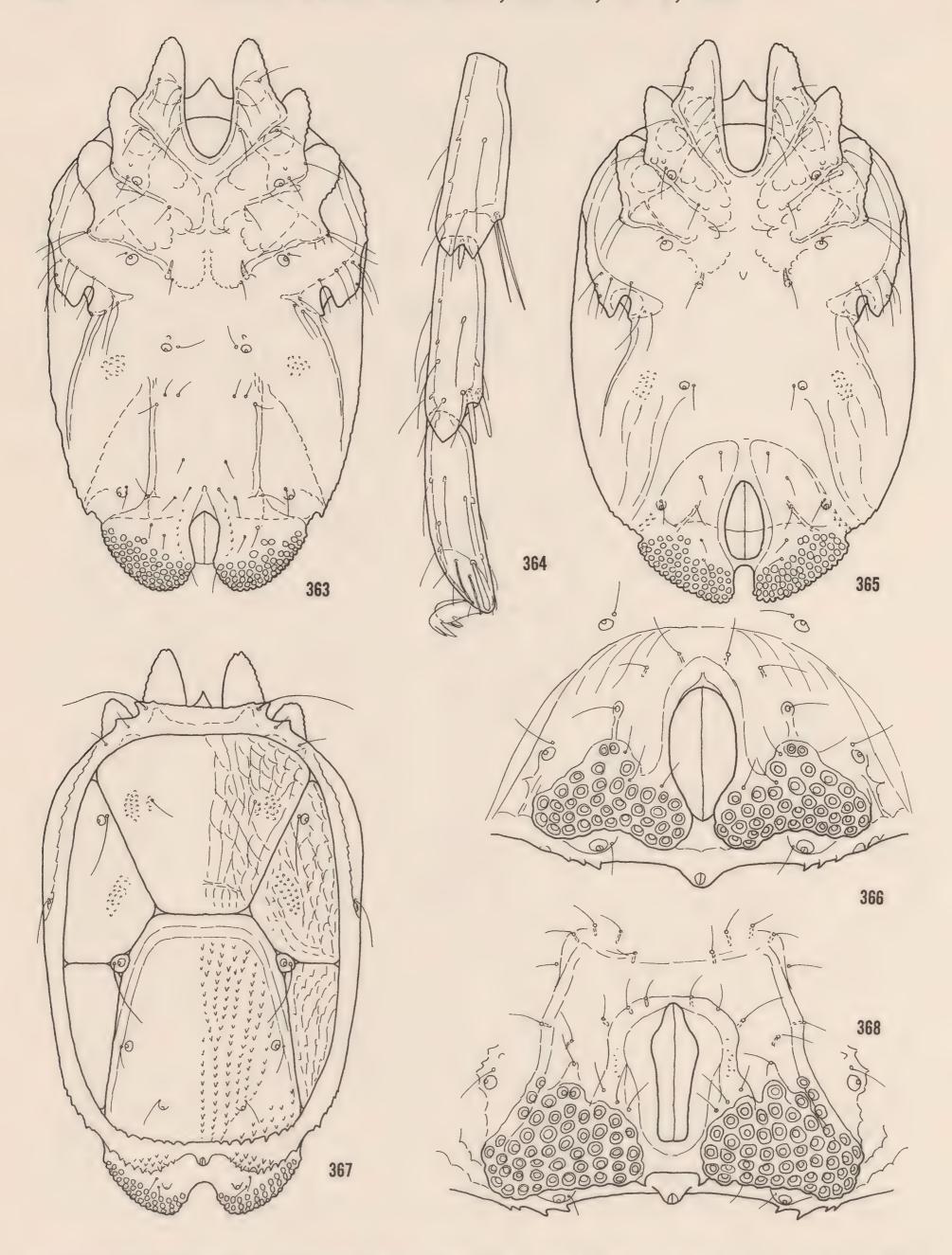


Piotaturus alvecaudatus n. sp. Fig. 349, ventral shield, σ ; Fig. 350, dorsal view, σ ; Fig. 351, palp, φ ; Fig. 352, distal segments of first leg, φ ; Fig. 353, posterior view of genital field region, σ ; Fig. 354, fourth leg, σ ; Fig. 355, capitulum and chelicera, φ .



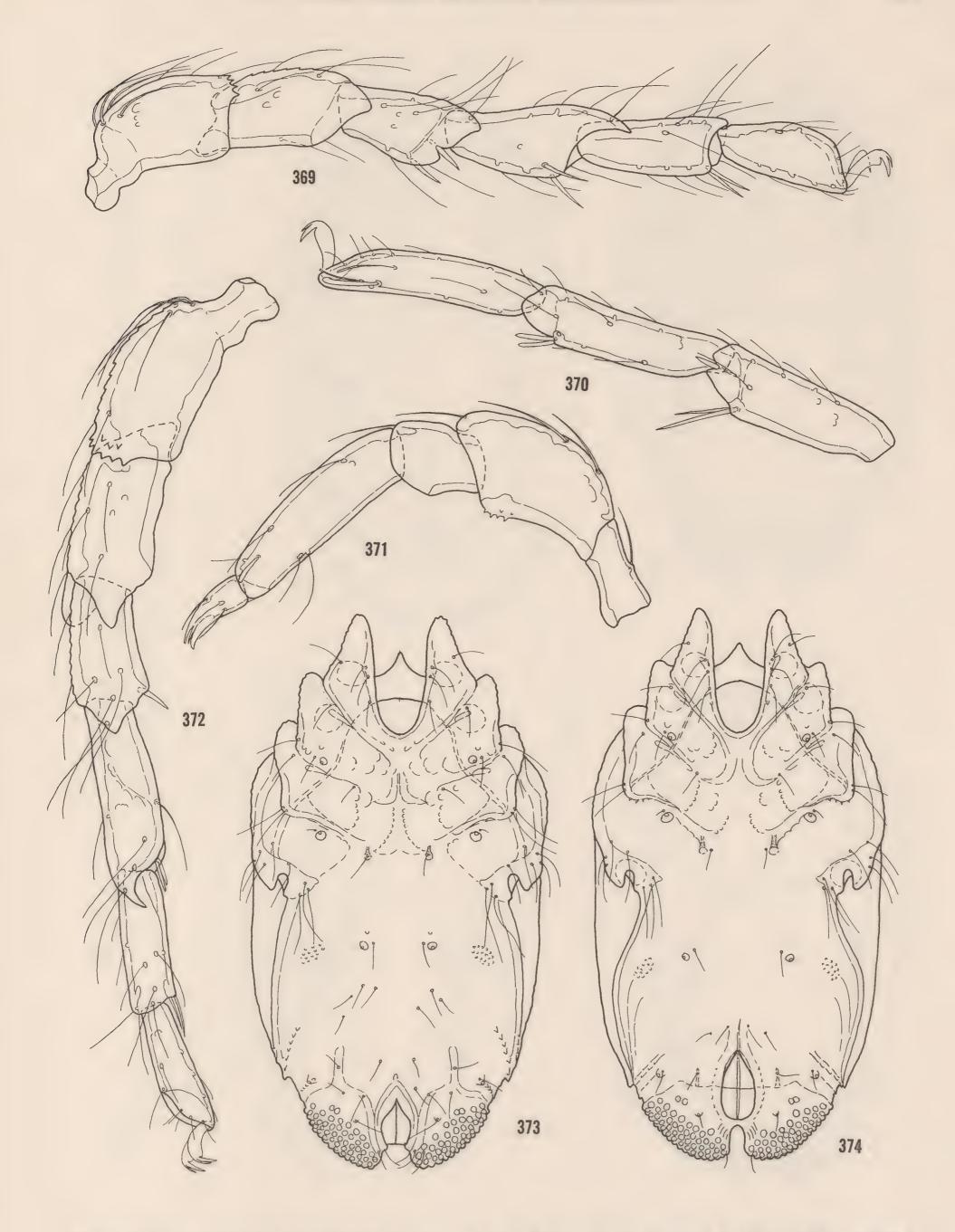
Piotaturus bovalus n. sp. (Female) Fig. 356, distal segments of fourth leg; Fig. 357, distal segments of first leg; Fig. 359, palp; Fig. 360, dorsal view; Fig. 361, ventral shield.

Piotaturus alvecaudatus n. sp. Fig. 358, ventral shield, \(\frac{1}{2} \). Pseudotryssaturus indentatus (Hopkins) Fig. 362, palp, \(\frac{1}{2} \).



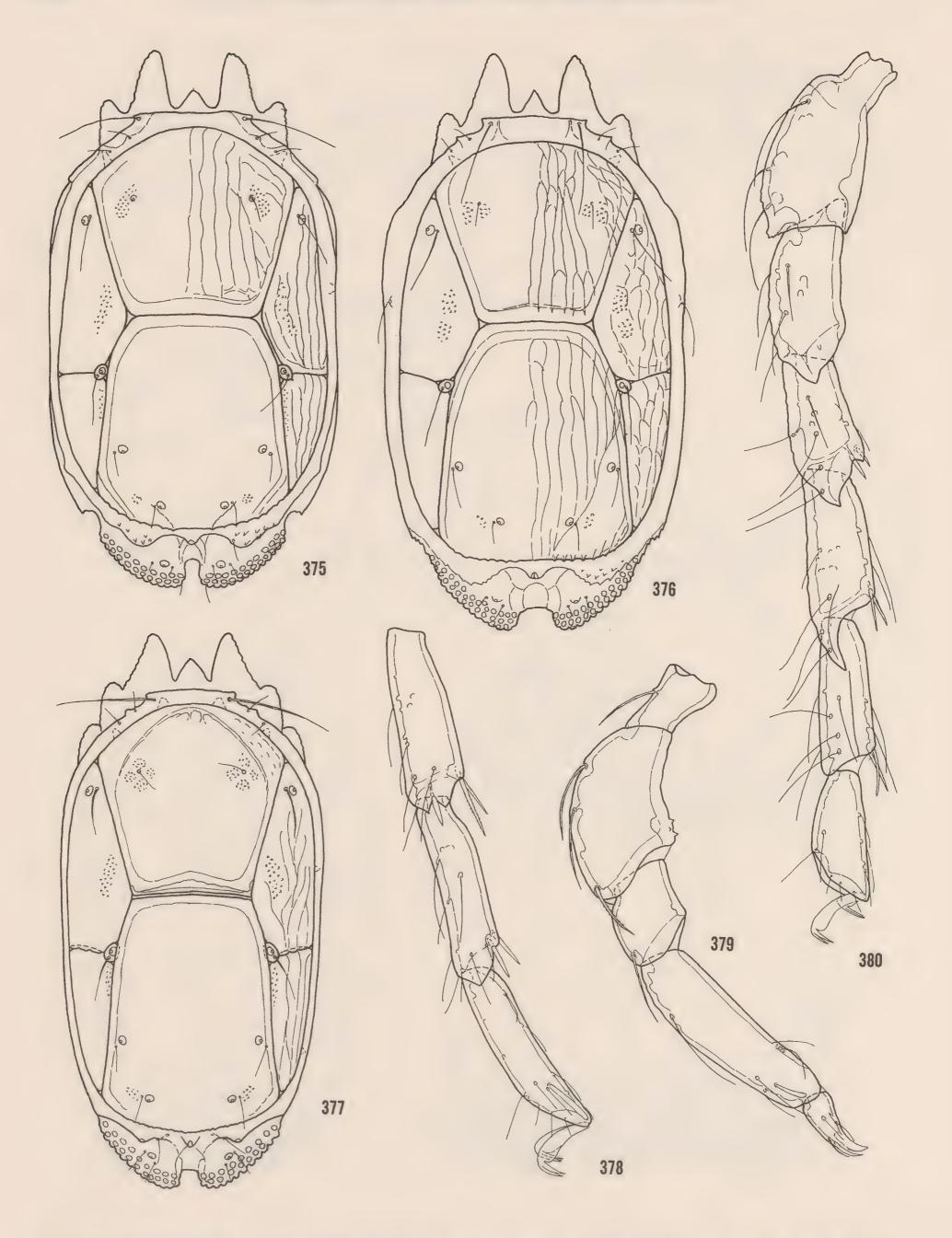
Pseudotryssaturus indentatus (Hopkins) Fig. 363, ventral shield, &; Fig. 364, distal segments of first leg, &; Fig. 365, ventral shield, &; Fig. 367, dorsal view, &.

Pseudotryssaturus anchistus n. sp. Fig. 366, posteroventral view of genital field, φ ; Fig. 368, posteroventral view of genital field, φ .



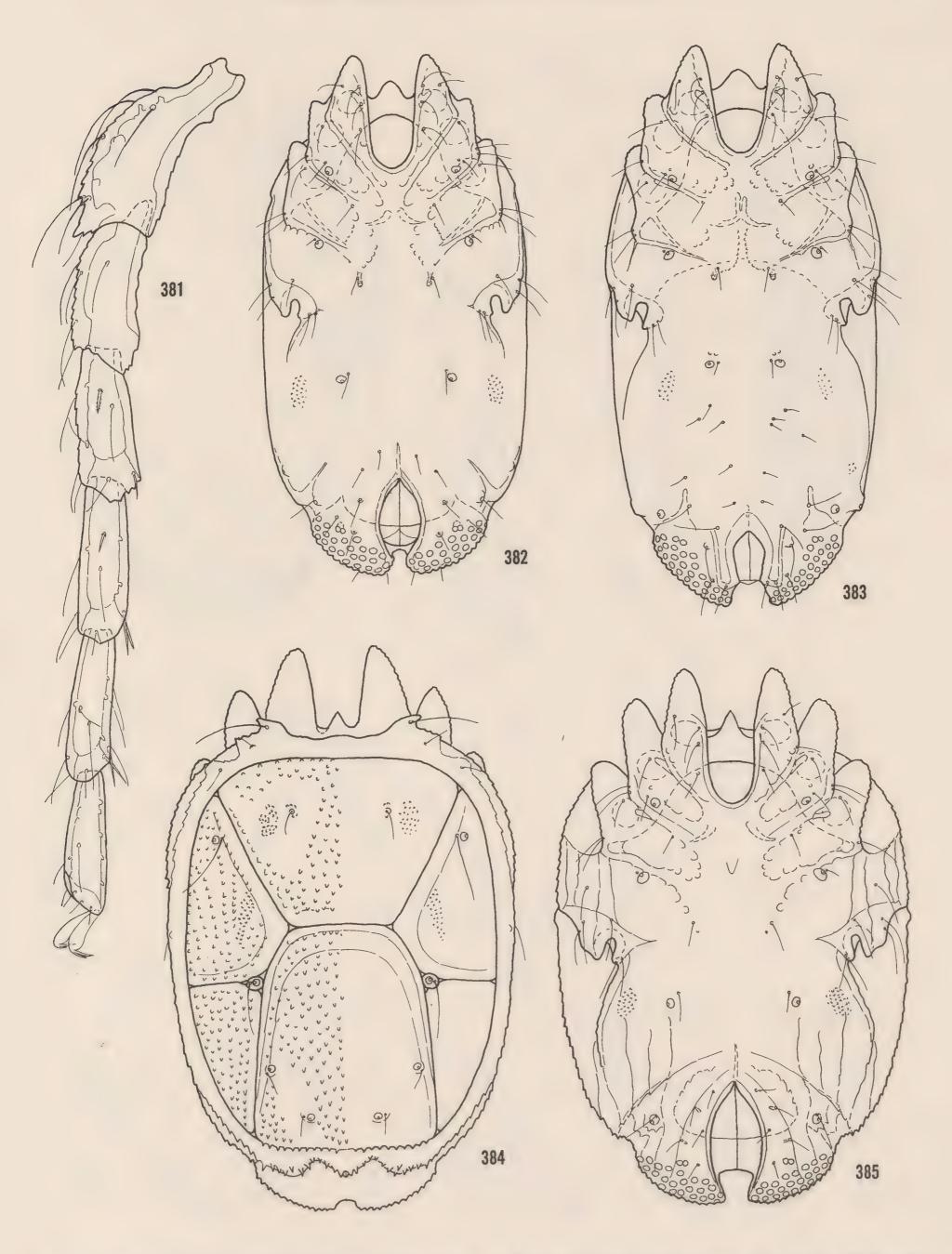
Pseudotryssaturus anchistus n. sp. Fig. 369, fourth leg, σ ; Fig. 370, distal segments of first leg, φ ; Fig. 371, palp, φ ; Fig. 373, ventral shield, σ ; Fig. 374, ventral shield, φ .

Pseudotryssaturus indentatus (Hopkins) Fig. 372, fourth leg, o.



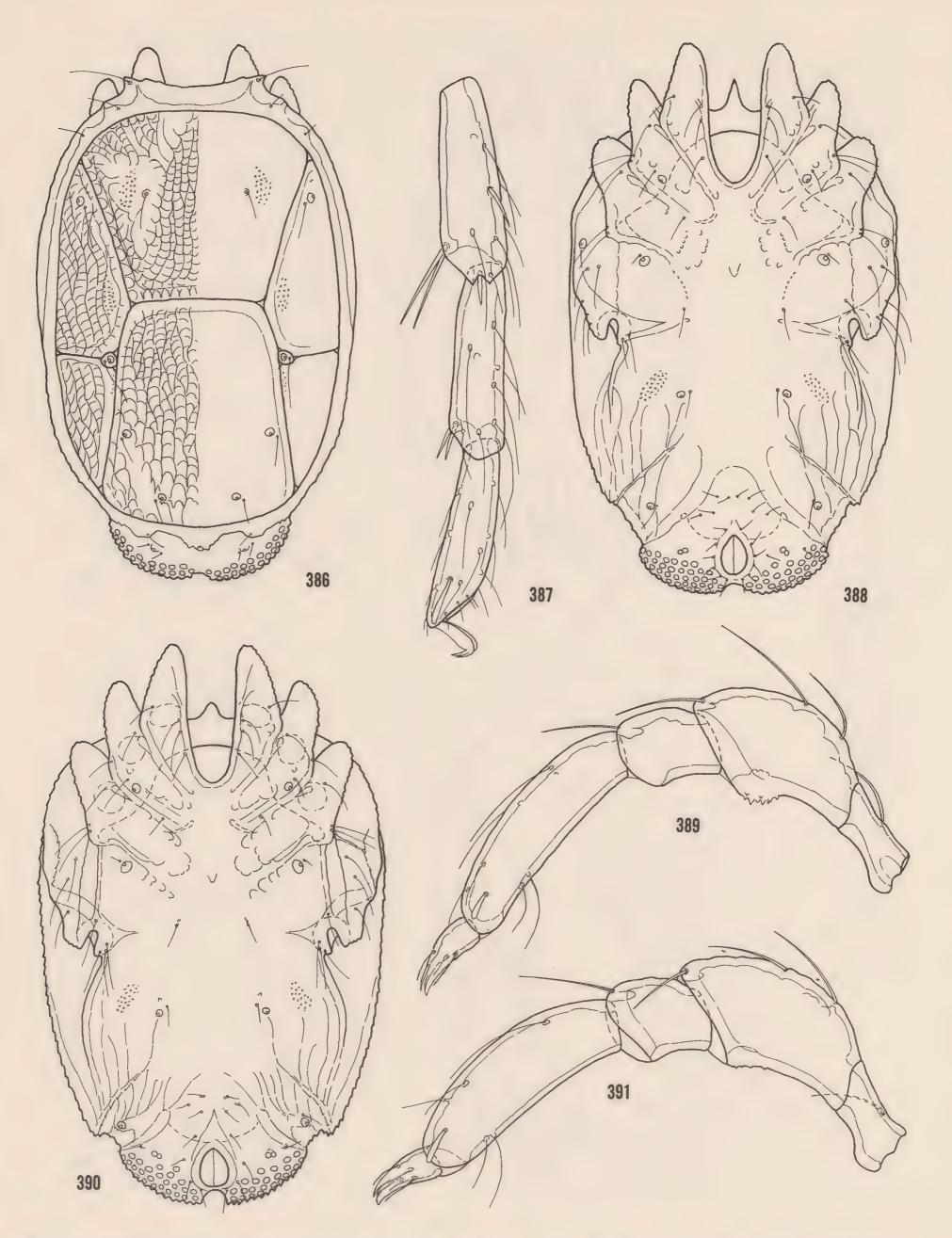
Pseudotryssaturus anchistus n. sp. Fig. 375, dorsal view, \(\sigma\); Fig. 376, dorsal view, \(\sigma\).

Pseudotryssaturus planus n. sp. Fig. 377, dorsal view, o'; Fig. 378, distal segments of first leg, \varphi; Fig. 379, palp; \varphi; Fig. 380, fourth leg, o'.

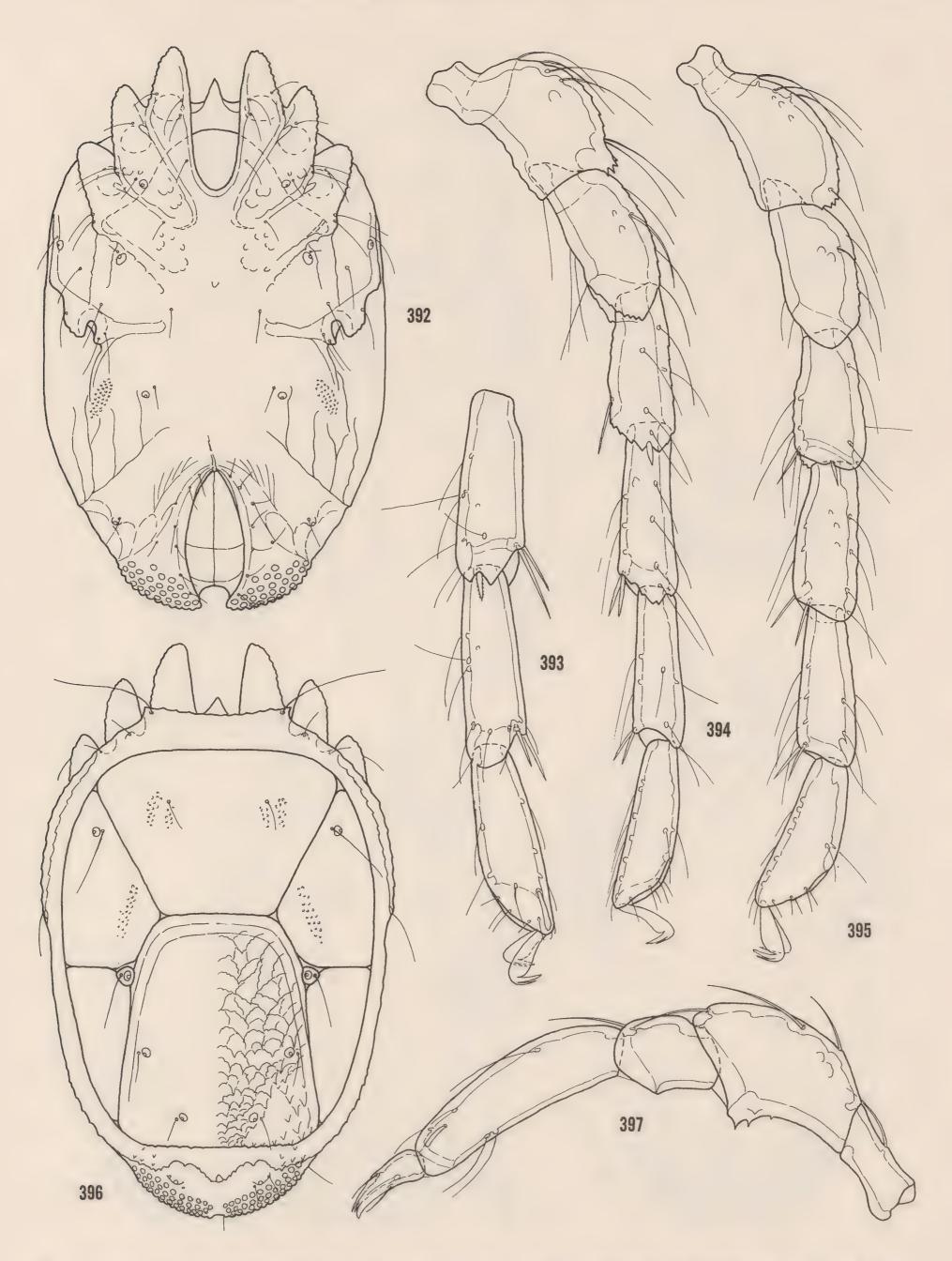


Pseudotryssaturus papillidermis n. sp. Fig. 381, fourth leg, of; Fig. 384, dorsal view, of; Fig. 385, ventral shield, of.

Pseudotryssaturus planus n. sp. Fig. 382, ventral shield, of; Fig. 383, ventral shield, of.

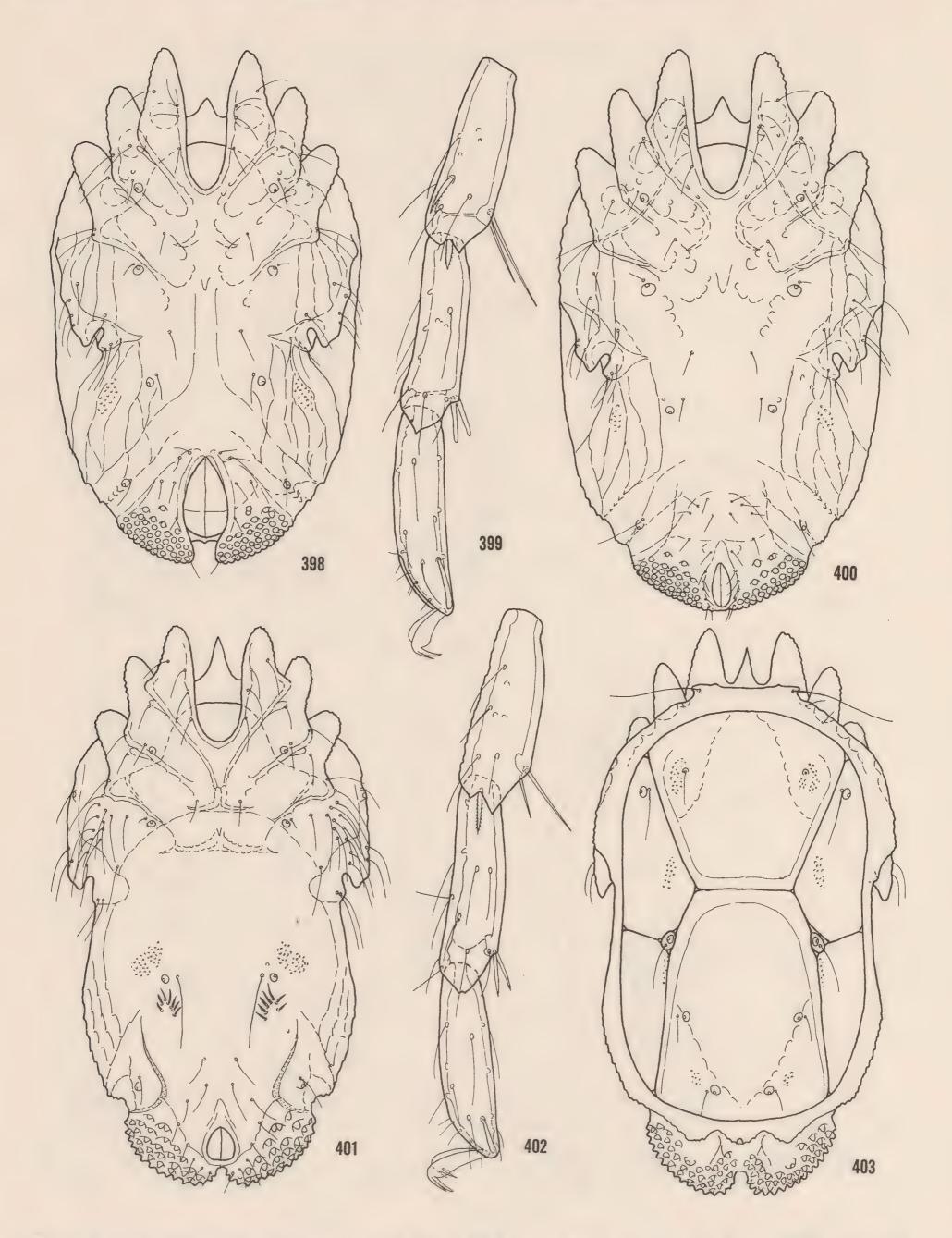


Pseudotryssaturus dictydermis n. sp. Fig. 386, dorsal view, o'; Fig. 388, ventral shield, o'; Fig. 391, palp, \varphi. Pseudotryssaturus papillidermis n. sp. Fig. 387, distal segments of first leg, φ ; Fig. 389, palp, φ ; Fig. 390, ventral shield, σ .



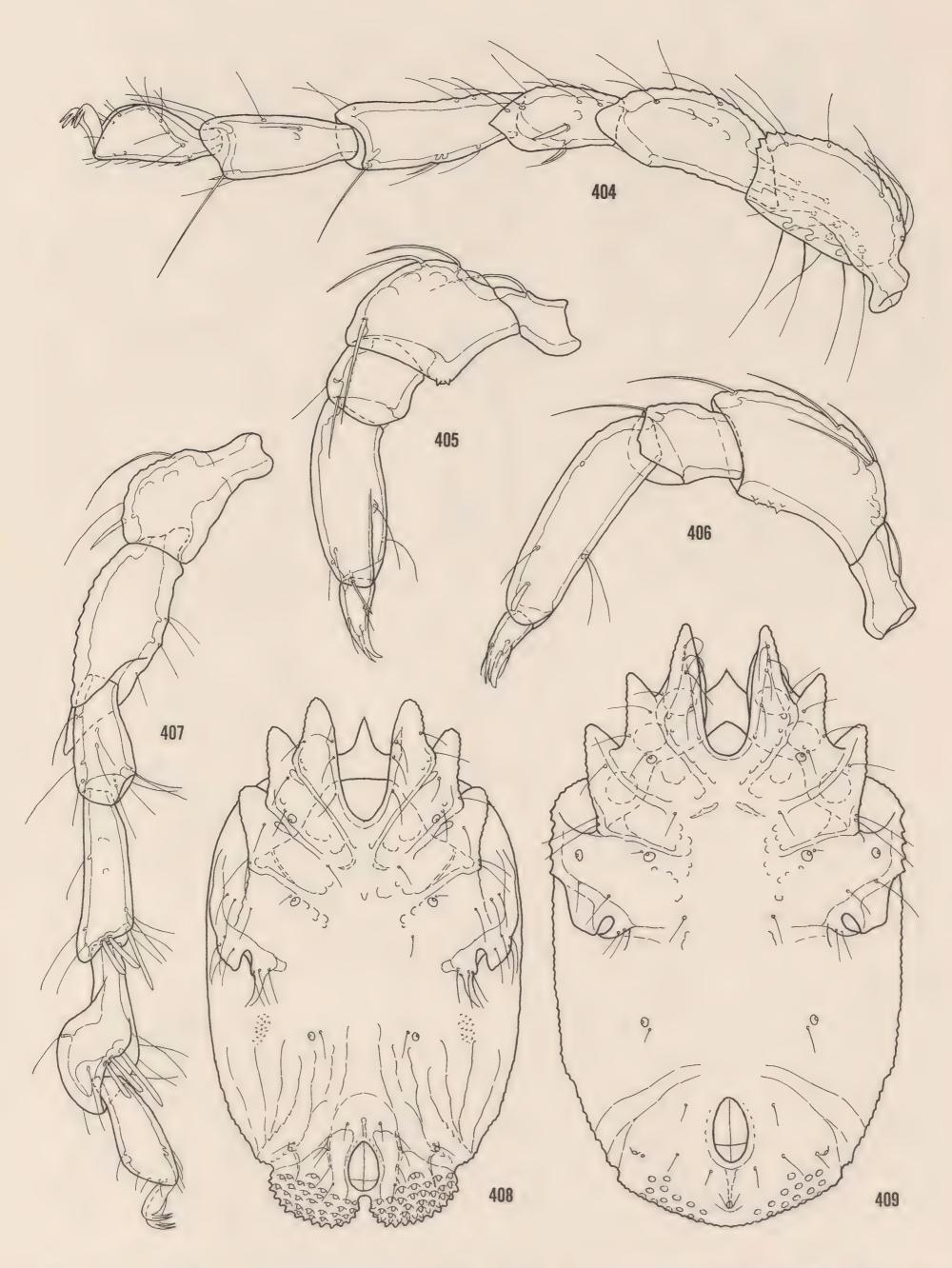
Pseudotryssaturus dictydermis n. sp. Fig. 392, ventral shield, \$\varphi\$; Fig. 393, distal segments of first leg, \$\varphi\$; Fig. 395, fourth leg, \$\varphi\$.

Pseudotryssaturus acutus n. sp. Fig. 394, fourth leg, \$\varphi\$; Fig. 396, dorsal view, \$\varphi\$; Fig. 397, palp, \$\varphi\$.



Pseudotryssaturus acutus n. sp. Fig. 398, ventral shield, \$\paralleq\$; Fig. 399, distal segments of first leg, \$\paralleq\$; Fig. 400, ventral shield, \$\sigma\$.

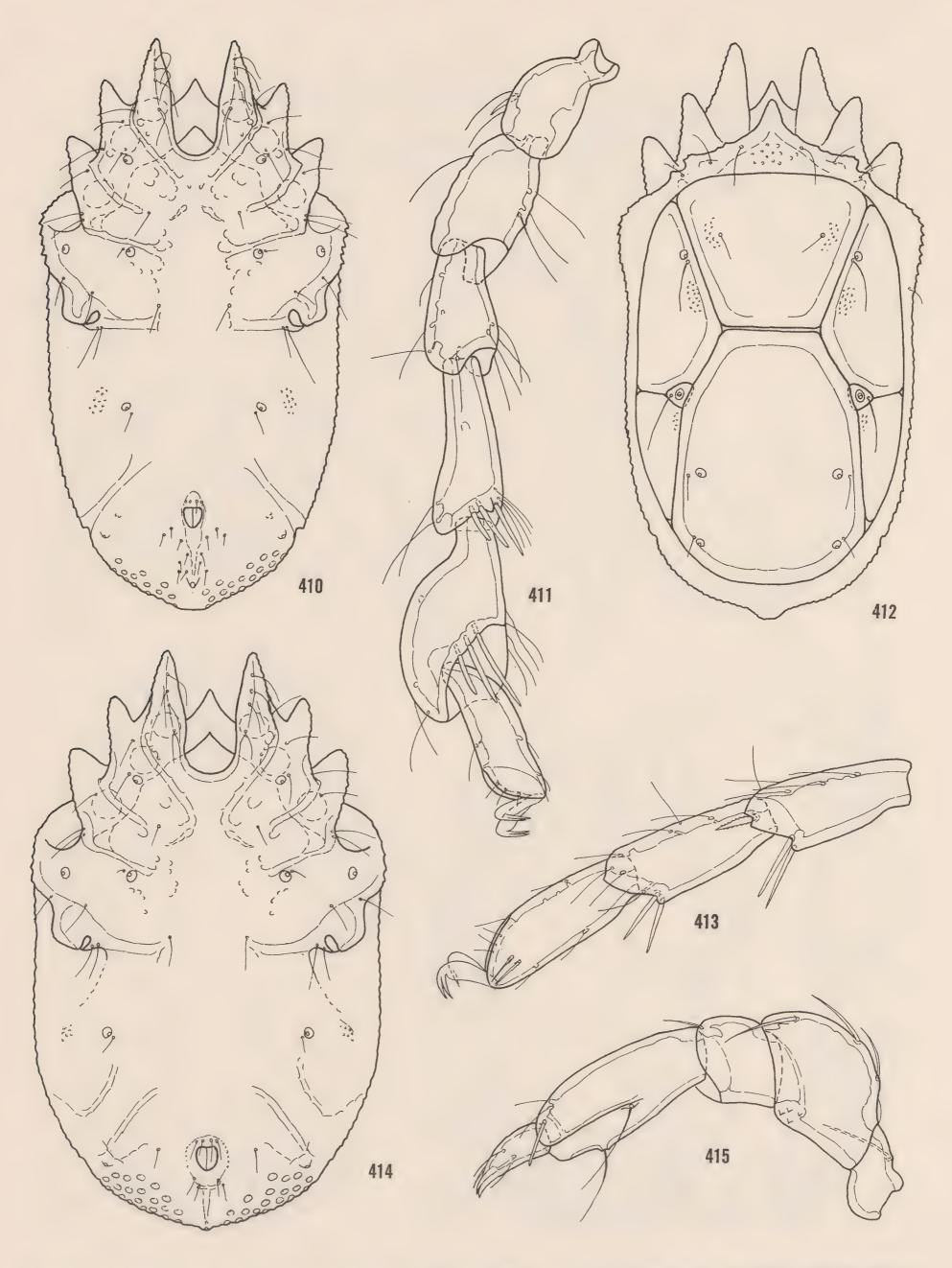
Pseudotryssaturus dapsilus n. sp. Fig. 401, ventral shield, \$\sigma\$; Fig. 402, distal segments of first leg, \$\paralleq\$; Fig. 403, dorsal view, \$\sigma\$.



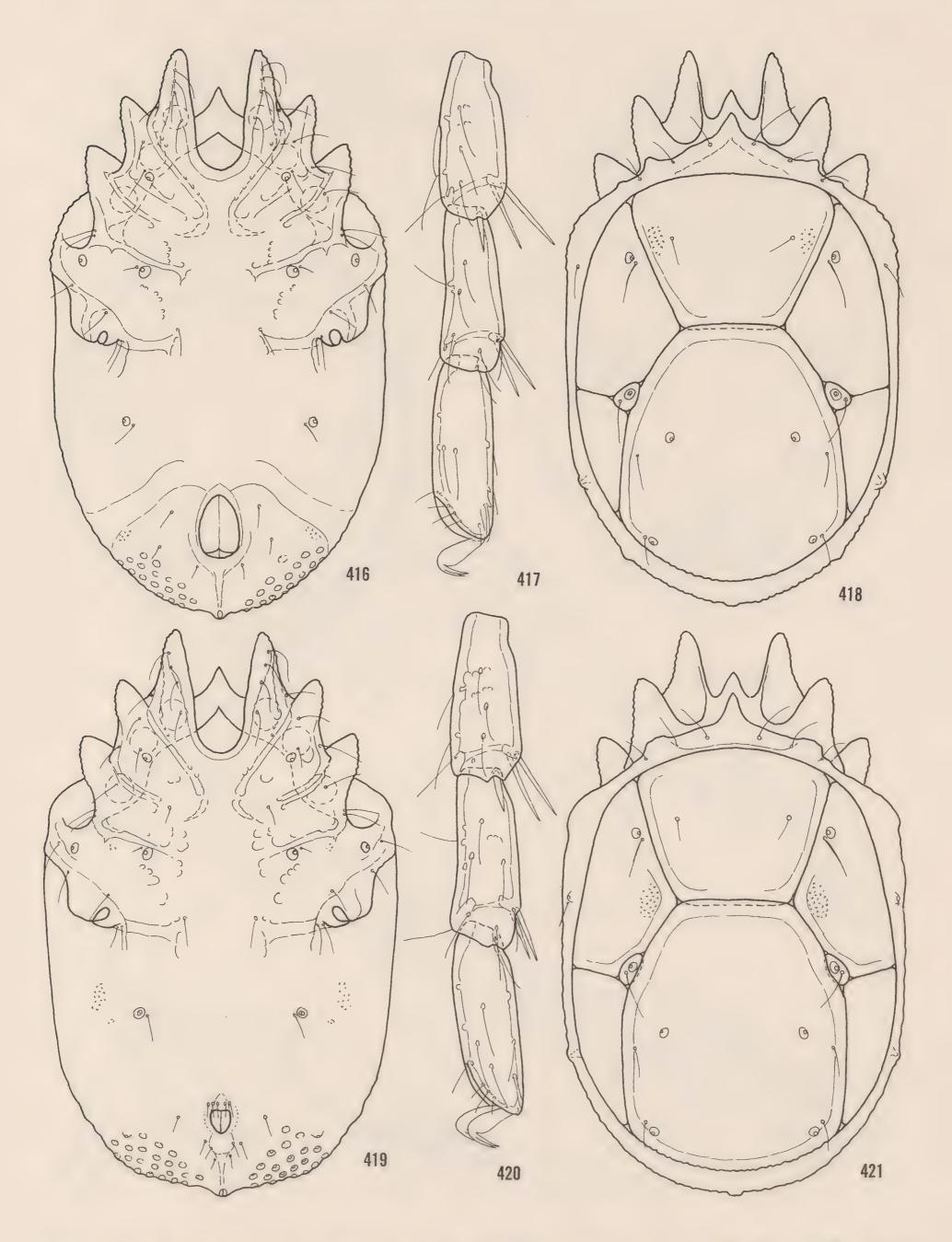
Pseudotryssaturus dapsilus n. sp. Fig. 404, fourth leg, o'; Fig. 406, palp, \chi; Fig. 408, ventral shield, \chi.

Paratryssaturus cantermus n. sp. Fig. 405, palp, \chi; Fig. 407, fourth leg, o';

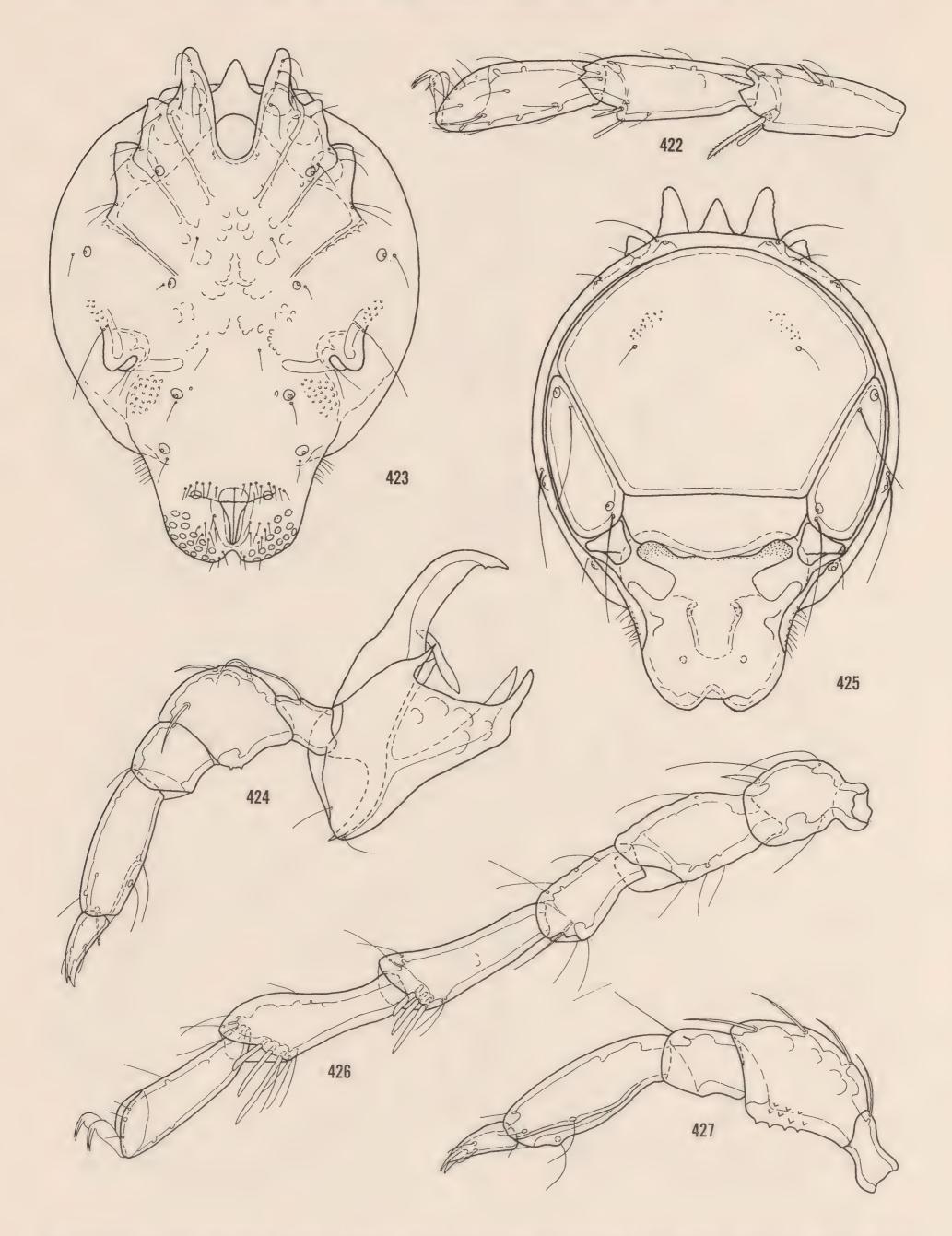
Fig. 409, ventral shield, \chi.



Paratryssaturus cantermus n. sp. Fig. 410, ventral shield, of; Fig. 412, dorsal view, of; Fig. 413, distal segments of first leg, of; Fig. 414, ventral shield, of; Fig. 415, palp, of; Fig. 416, ventral shield, of; Fig. 416, palp, of; Fig. 416, palp, of; Fig. 417, ventral shield, of; Fig. 418, ve

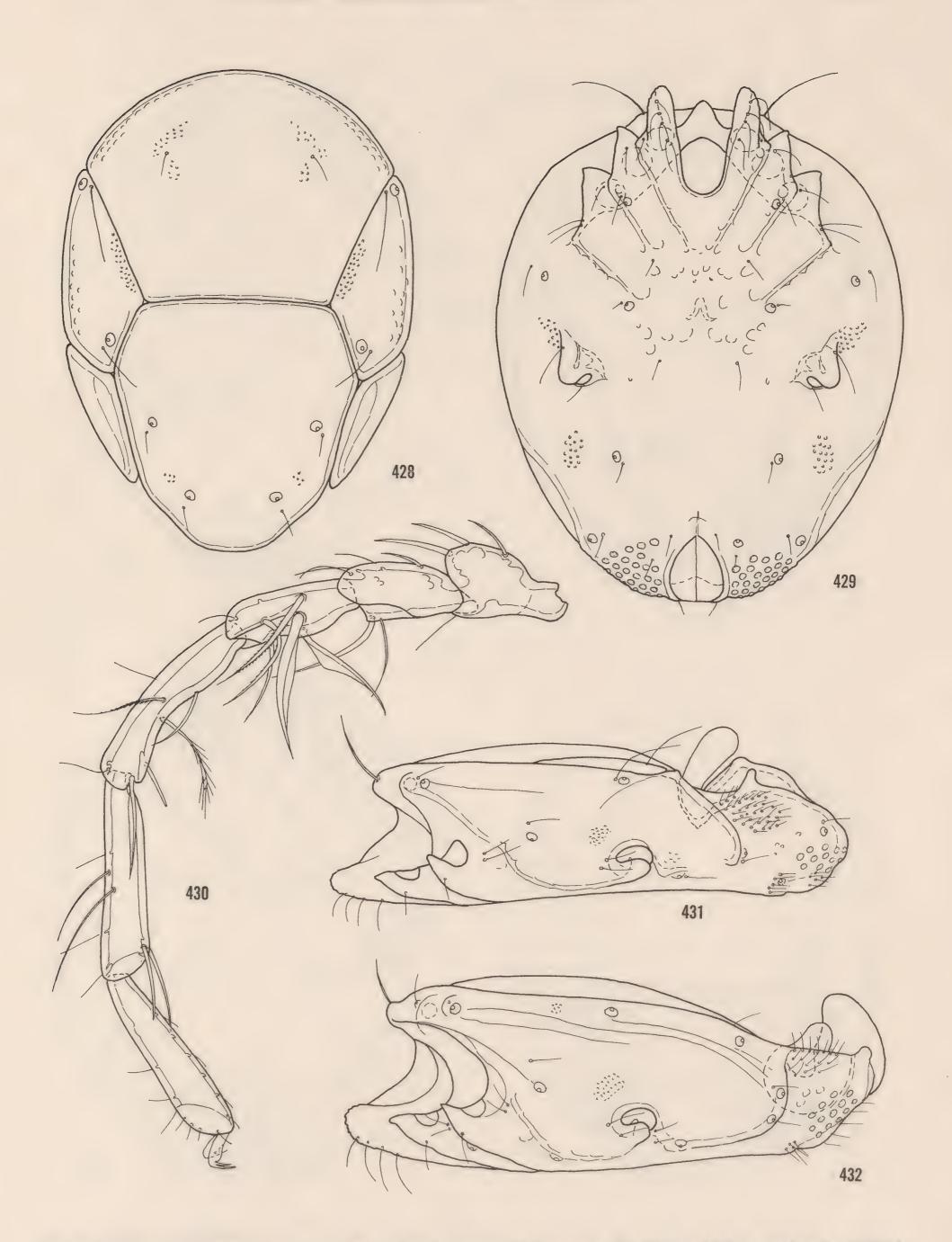


Paratryssaturus minutus (Hopkins) Fig. 416, ventral shield, \$\paratryssaturus all first leg, \$\para



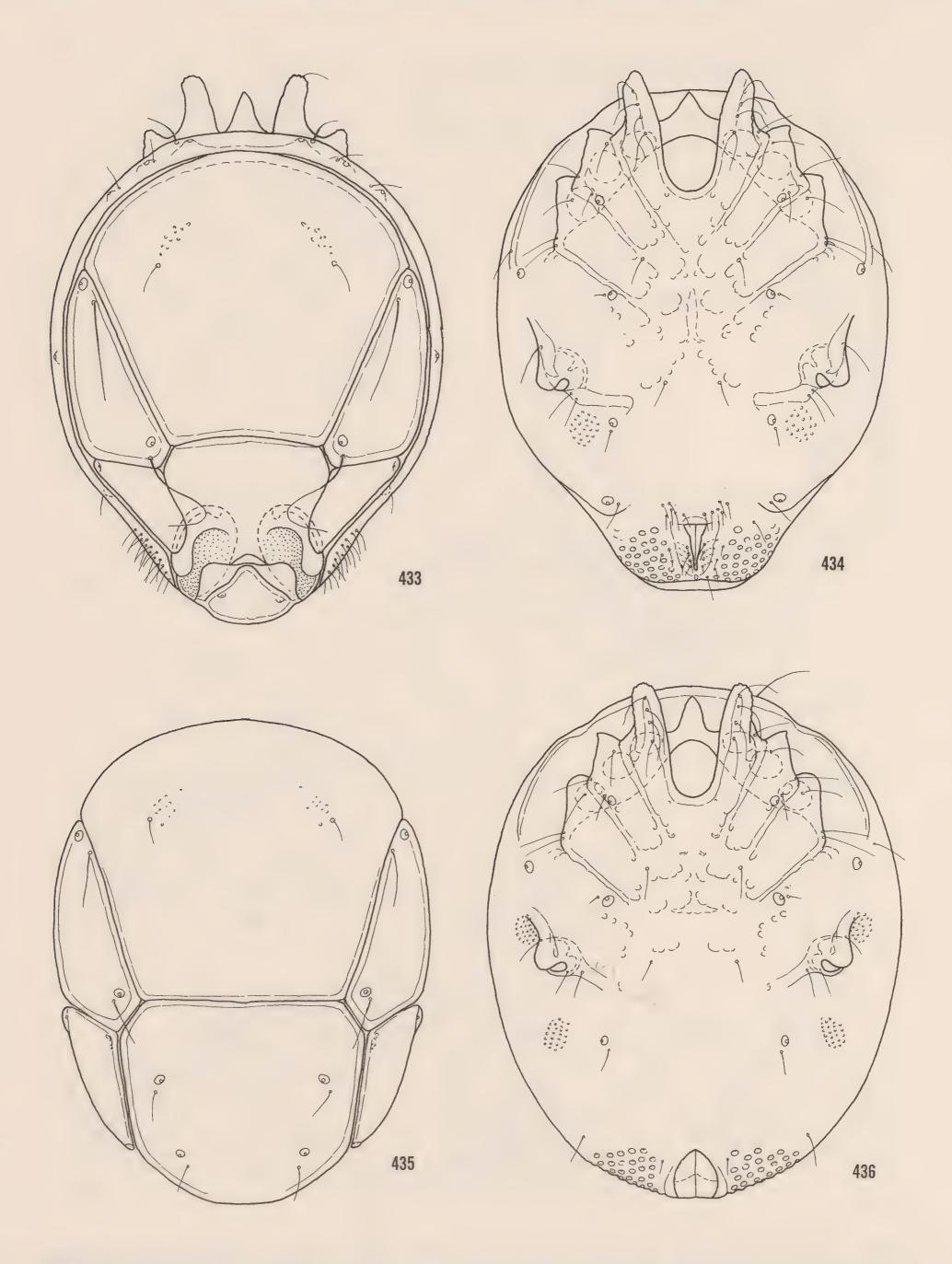
Kritaturus jacundus n. sp. Fig. 422, distal segments of first leg, \(\varphi\); Fig. 423, ventral shield, \(\sigma\); Fig. 425, dorsal view, \(\sigma\); Fig. 427, palp, \(\varphi\).

Paratryssaturus zodelus n. sp. Fig. 424, lateral view of capitulum, chelicera and palp, \(\sigma\); Fig. 426, fourth leg, \(\sigma\).

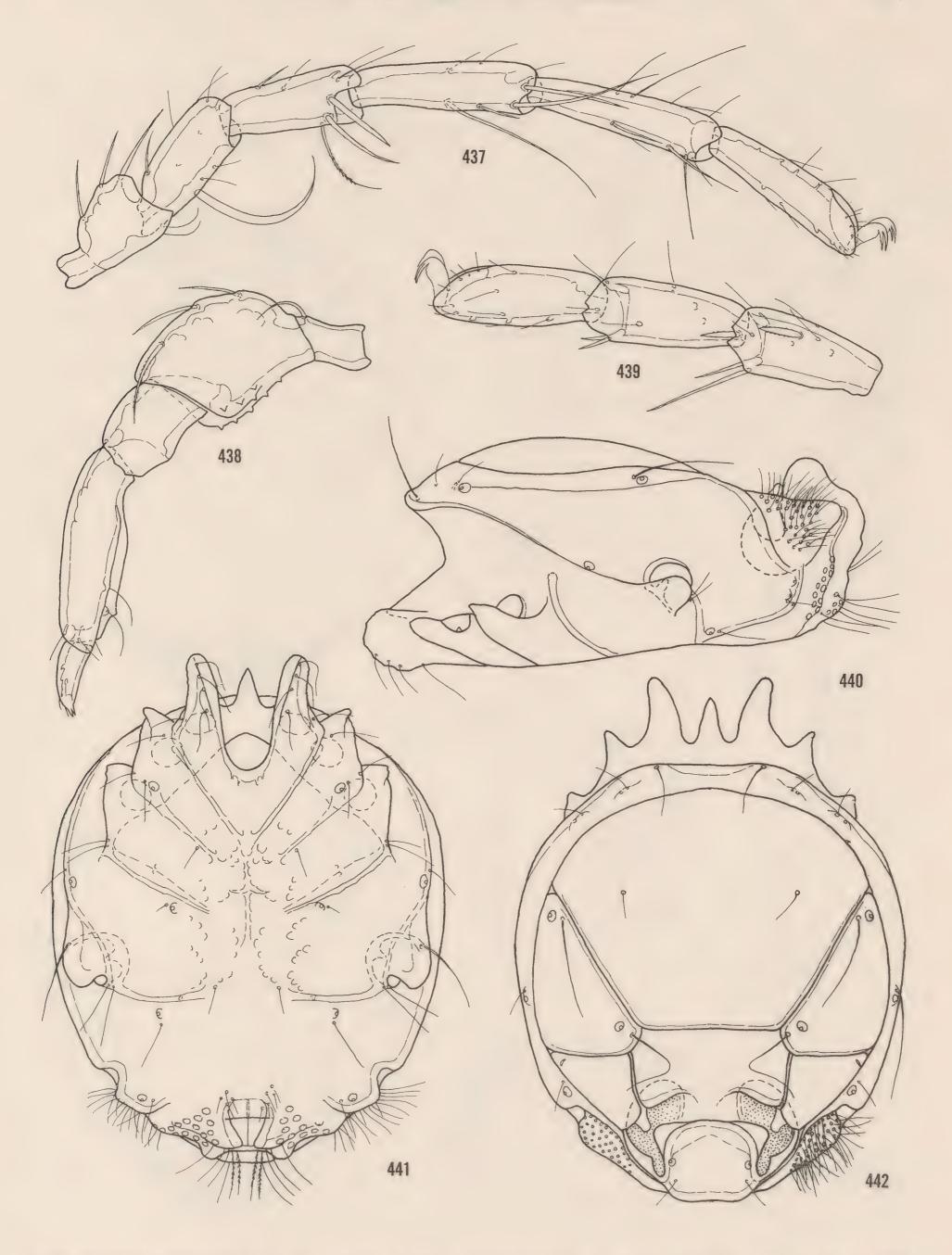


Kritaturus jacundus n. sp. Fig. 428, dorsal shield, ♀; Fig. 429, ventral shield, ♀; Fig. 430, fourth leg, ♂; Fig. 431, lateral view, ♂.

Kritaturus tenonus n. sp. Fig. 432, lateral view, ♂.

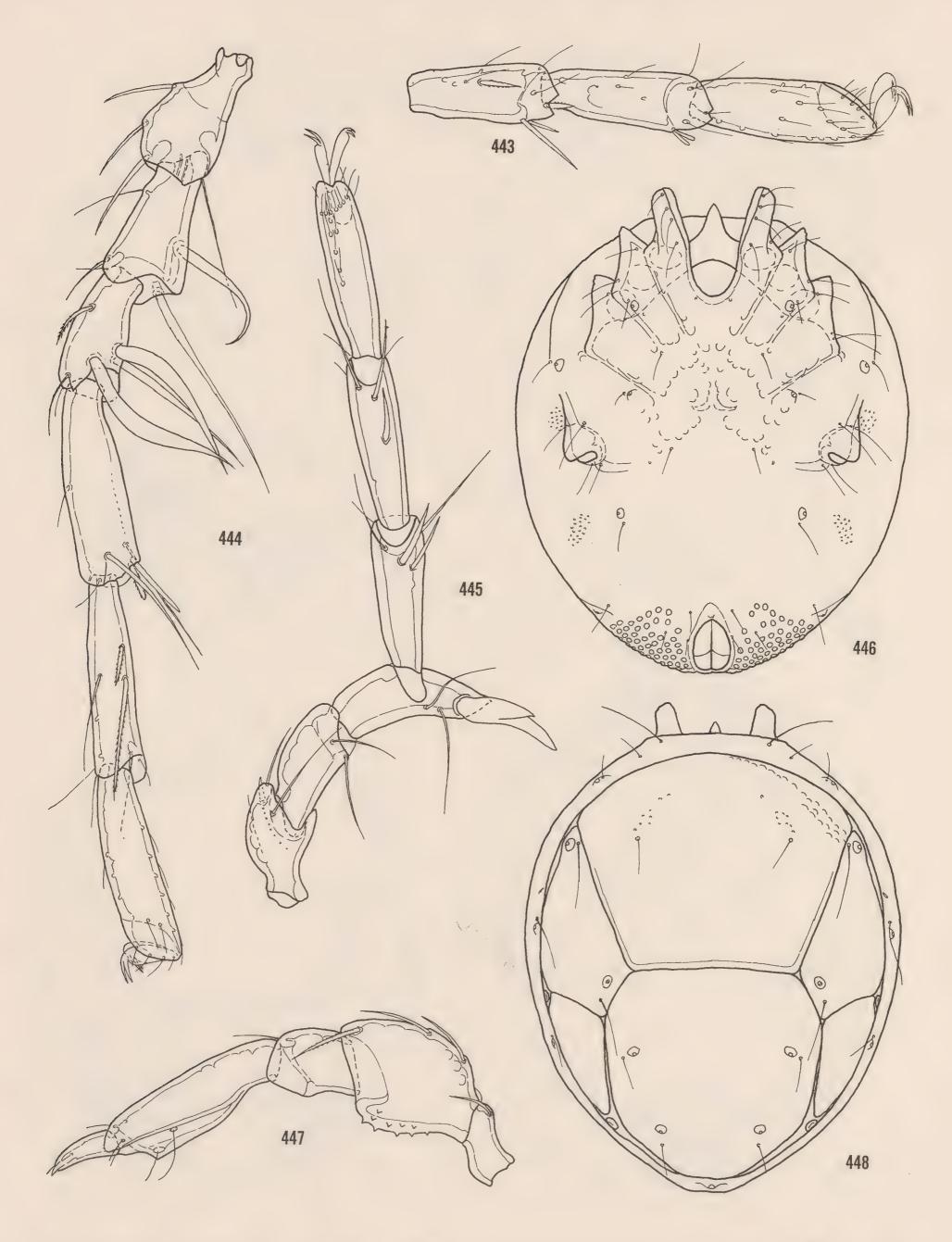


Kritaturus tenonus n. sp. Fig. 433, dorsal view, σ ; Fig. 434, ventral shield, σ ; Fig. 435, dorsal shield, φ ; Fig. 436, ventral shield, φ .



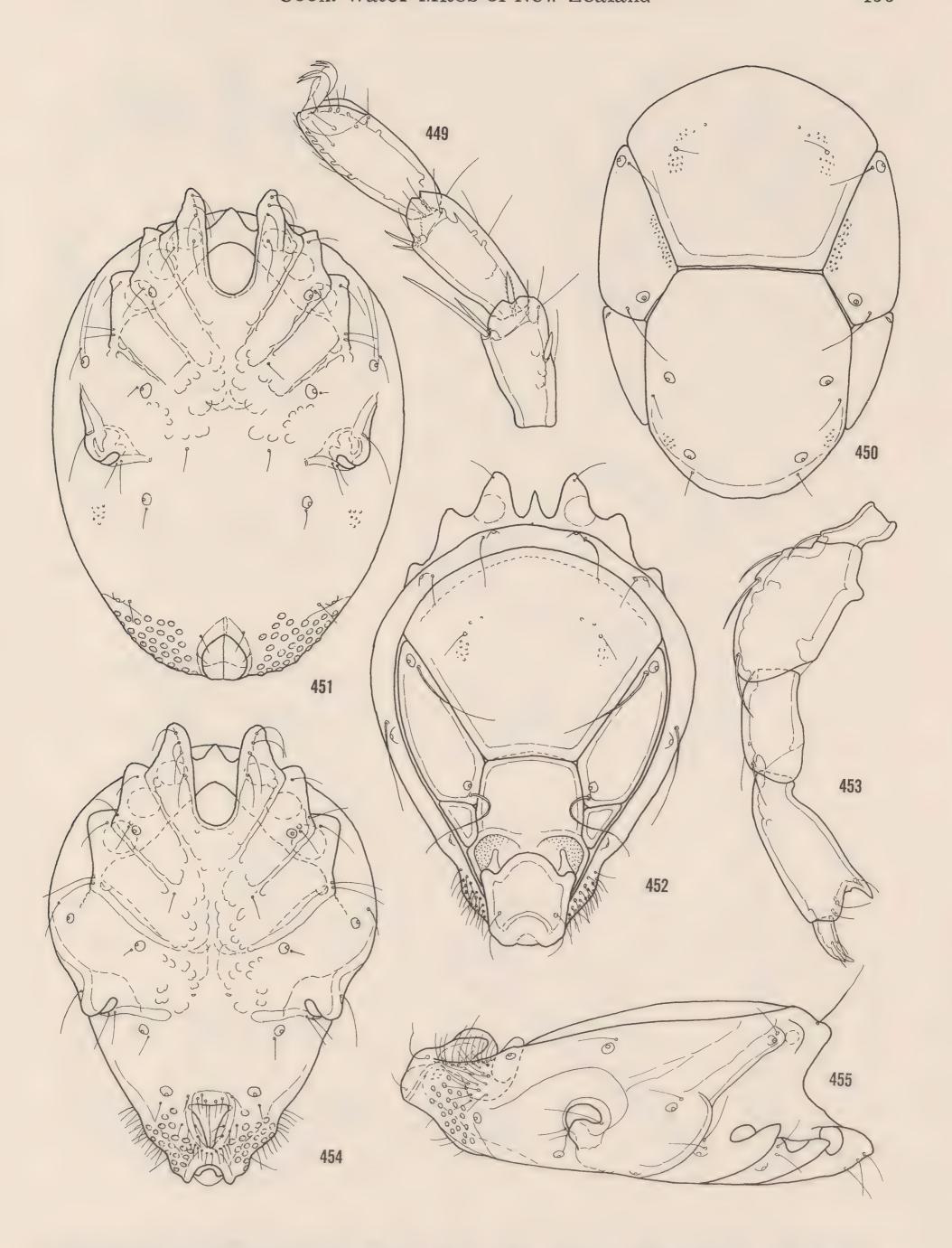
Kritaturus tenonus n. sp. Fig. 437, fourth leg, o'; Fig. 438, palp, \cong Fig. 439, distal segments of first leg, \cong.

Kritaturus rucabus n. sp. Fig. 440, lateral view, o; Fig. 441, ventral shield, o; Fig. 442, dorsal view, o.

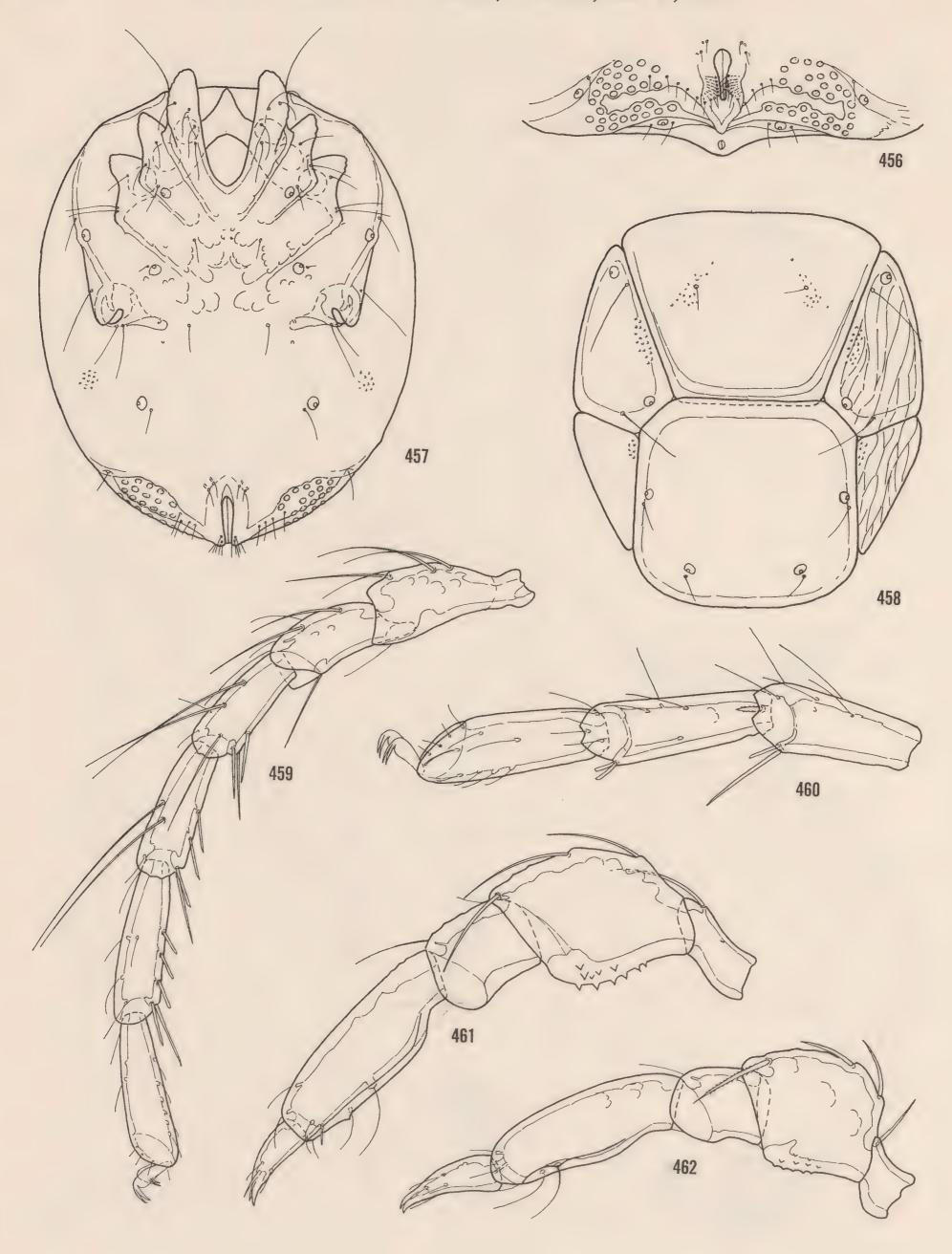


Kritaturus rucabus n. sp. Fig. 443, distal segments of first leg, σ ; Fig. 444, fourth leg, σ ; Fig. 446, ventral shield, φ ; Fig. 447, palp, σ ; Fig. 448, dorsal view, φ .

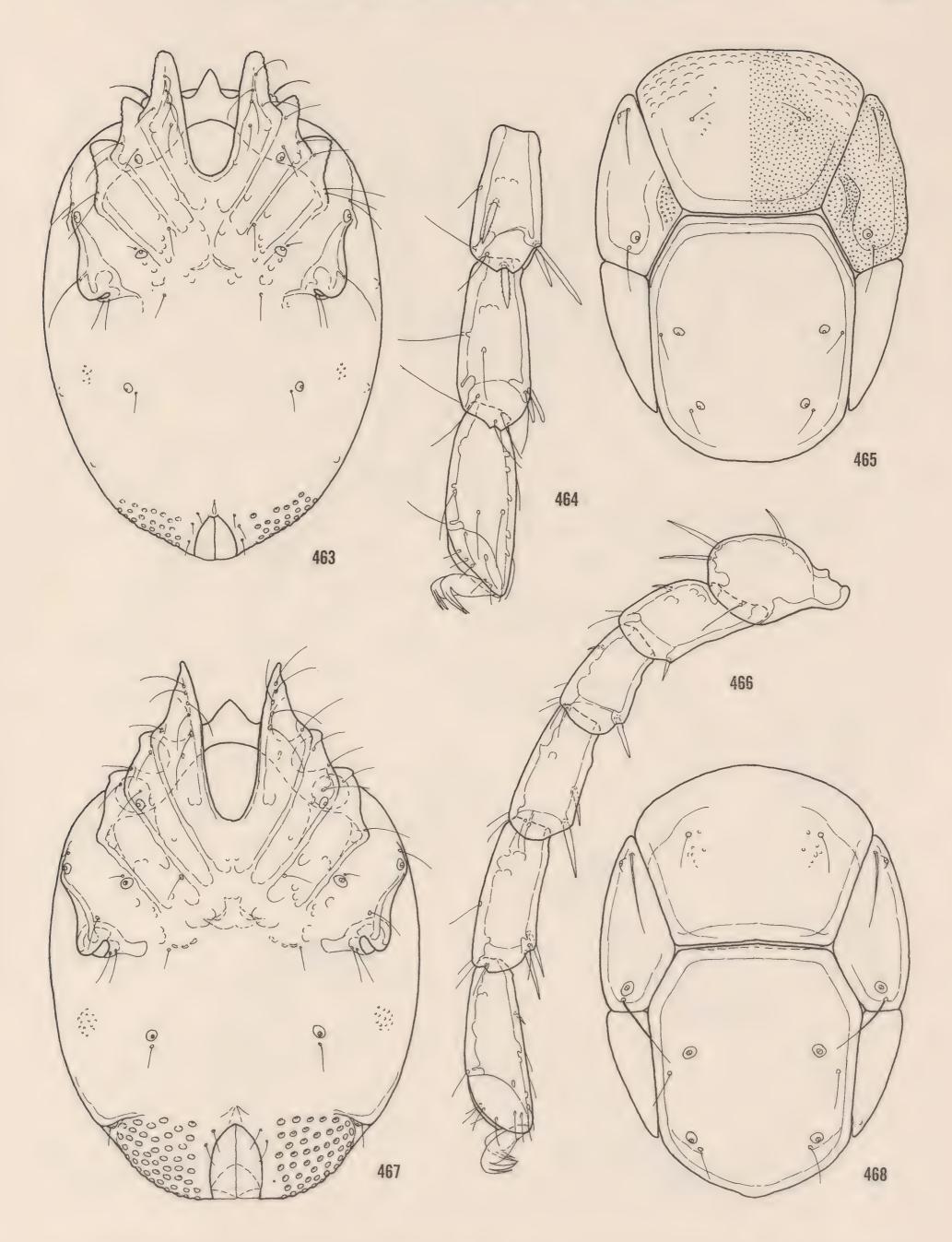
Kritaturus uncipalpis n. sp. Fig. 445, fourth leg, o.



Kritaturus uncipalpis n. sp. Fig. 449, distal segments of first leg, ♀; Fig. 450, dorsal shield, ♀; Fig. 451, ventral shield, ♀; Fig. 452, dorsal view, ♂; Fig. 453, palp, ♀; Fig. 454, ventral shield, ♂; Fig. 455, lateral view, ♂.

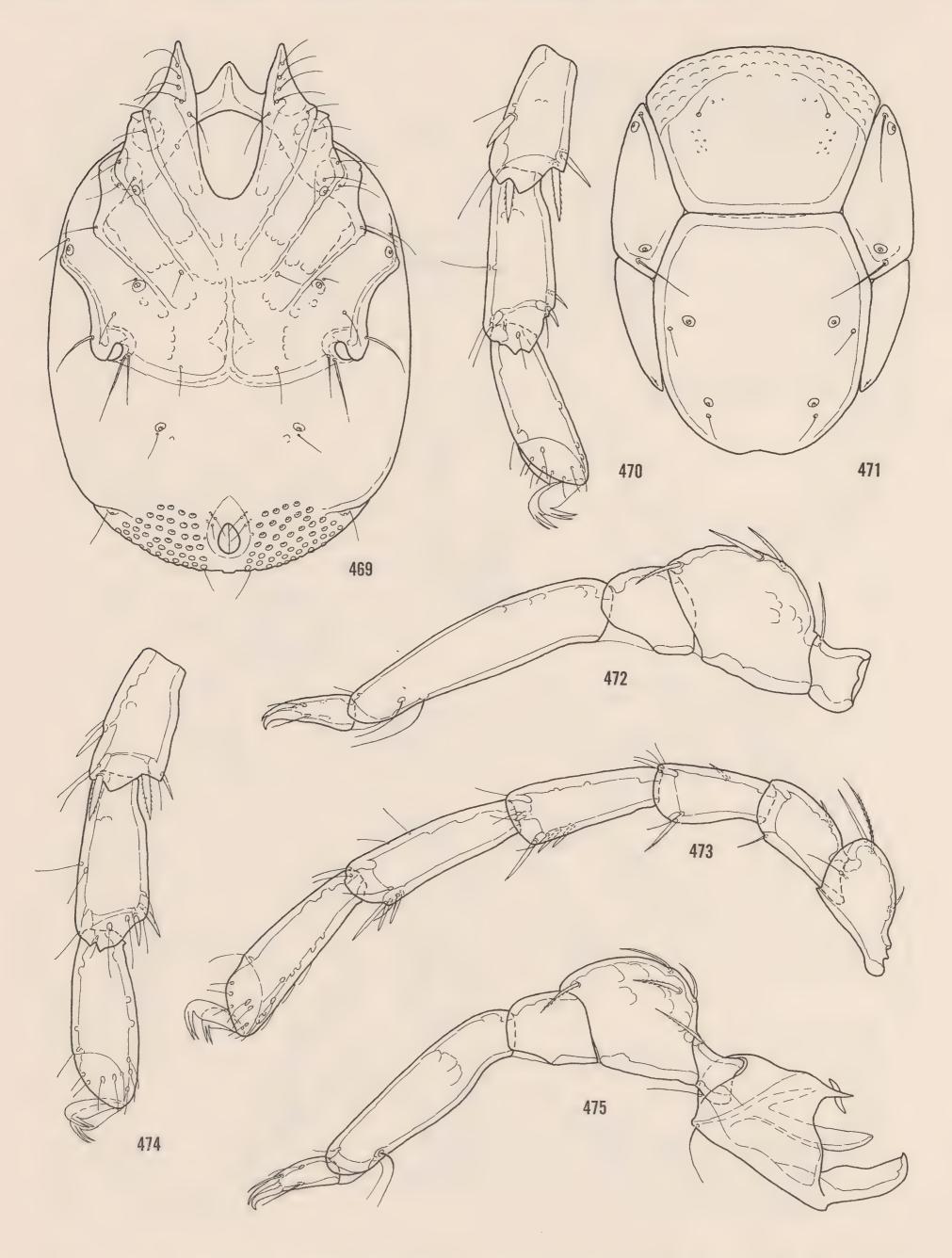


Kritaturus sornus n. sp. (Male) Fig. 456, posteroventral view of genital field; Fig. 457, ventral shield; Fig. 458, dorsal shield; Fig. 459, fourth leg; Fig. 460, distal segments of first leg; Fig. 461, palp.
Kritaturus ianthus n. sp. Fig. 462, palp, \(\beta\).



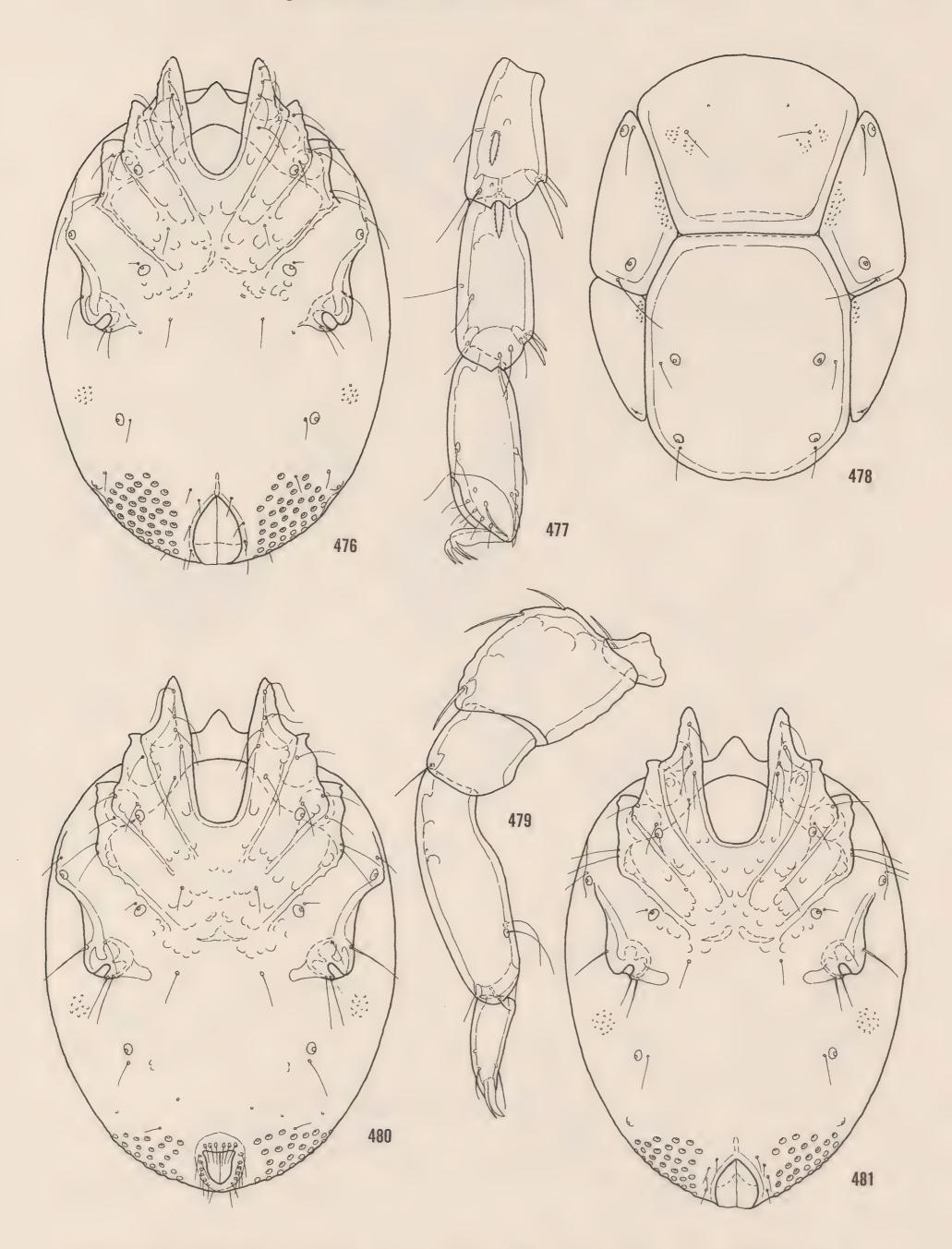
Kritaturus ianthus n. sp. (Female) Fig. 463, ventral shield; Fig. 464, distal segments of first leg; Fig. 465, dorsal shield.

Kritaturus gennadus n. sp. Fig. 466, fourth leg, &; Fig. 467, ventral shield, \$\foat\frac{1}{2}\$; Fig. 468, dorsal shield, \$\foat\frac{1}{2}\$.



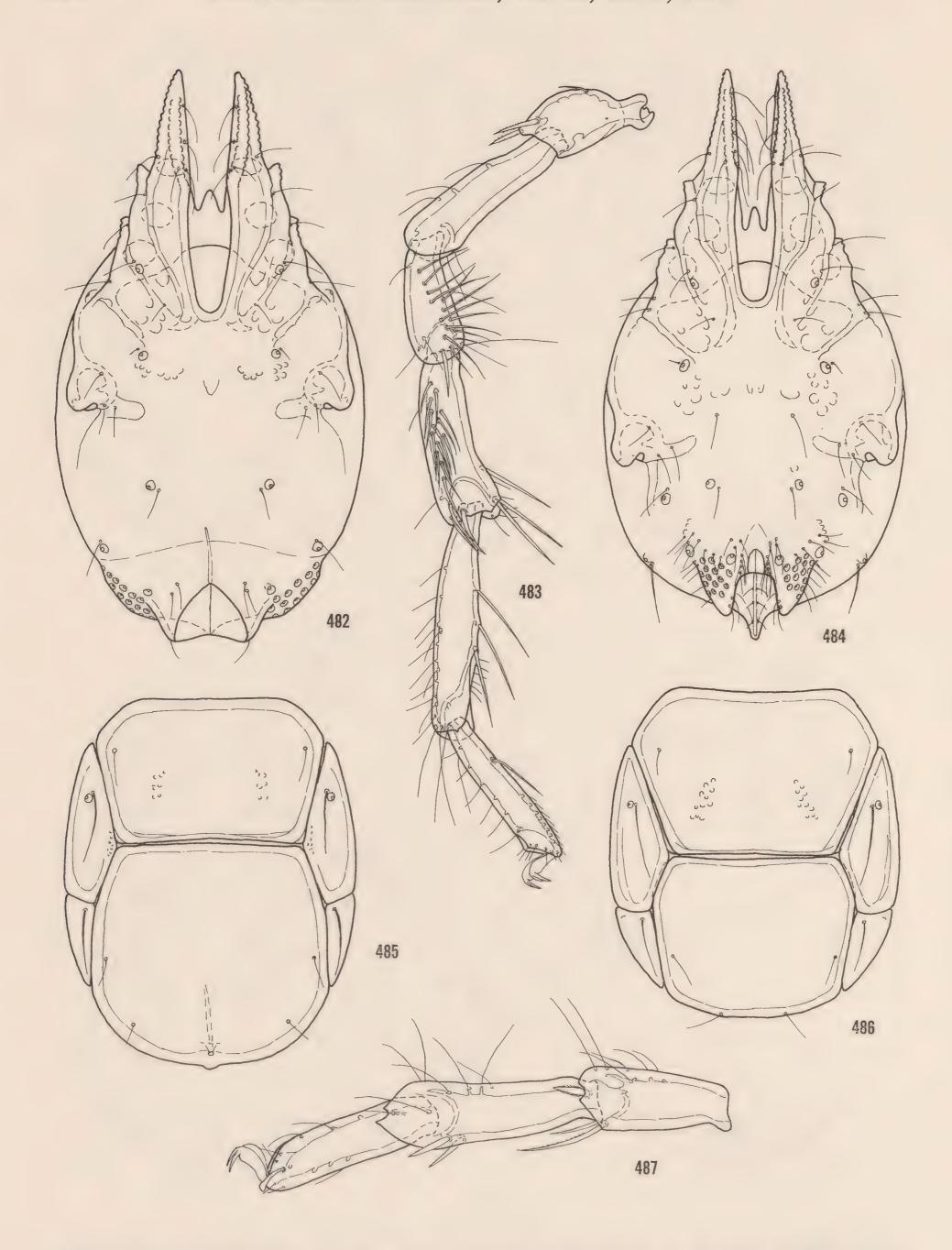
Kritaturus gennadus n. sp. Fig. 469, ventral shield, σ ; Fig. 470, distal segments of first leg, φ ; Fig. 471, dorsal shield, σ ; Fig. 472, palp, φ .

Kritaturus dornarus n. sp. Fig. 473, fourth leg, σ ; Fig. 474, distal segments of first leg, φ ; Fig. 475, lateral view of capitulum, chelicera and palp, φ .

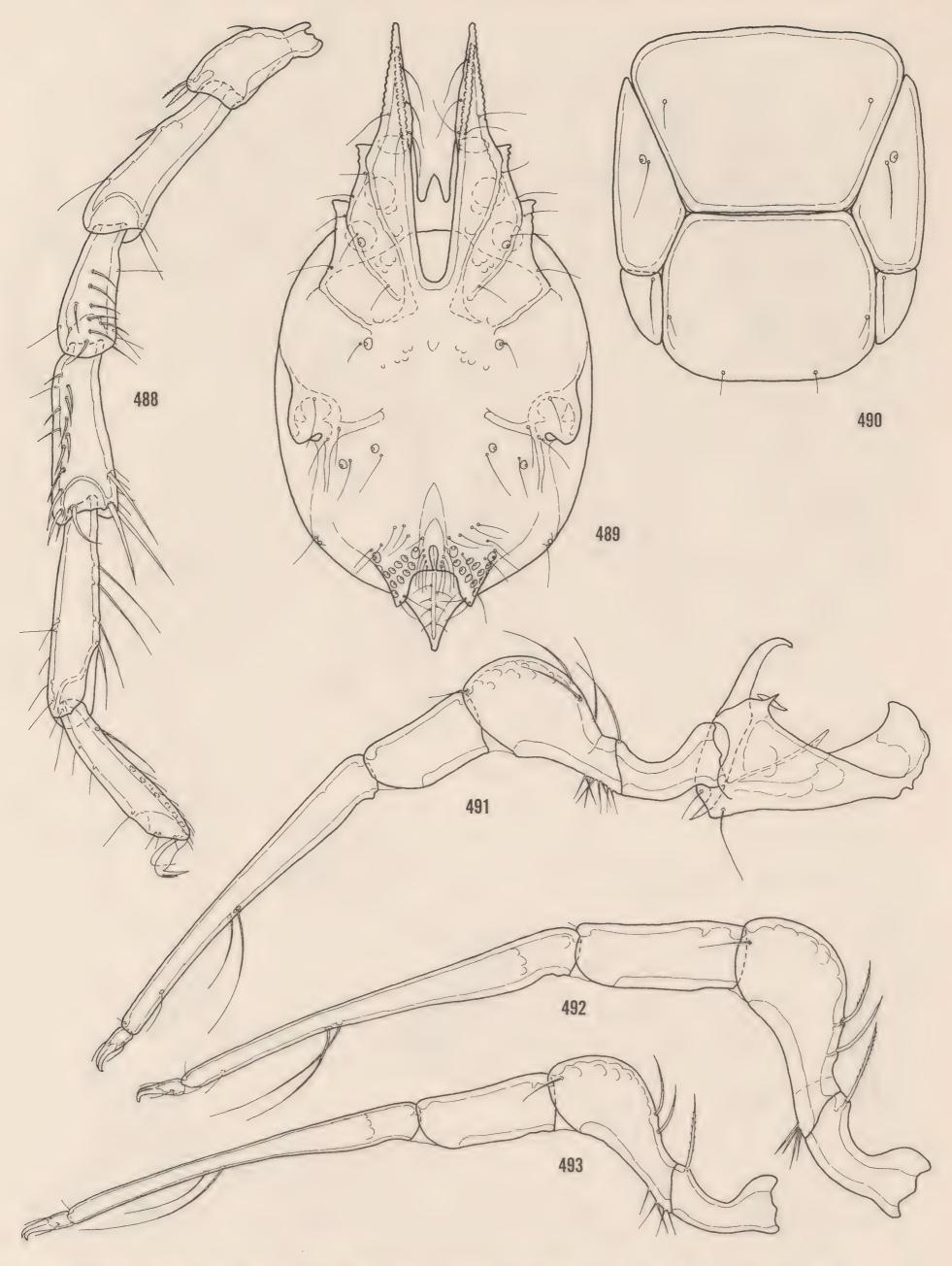


Kritaturus vinnulus n. sp. (Female) Fig. 476, ventral shield; Fig. 477, distal segments of first leg; Fig. 478, dorsal shield; Fig. 479, palp.

Kritaturus dornarus n. sp. Fig. 480, ventral shield, o'; Fig. 481, ventral shield, o'; Fig. 481, ventral shield, o';



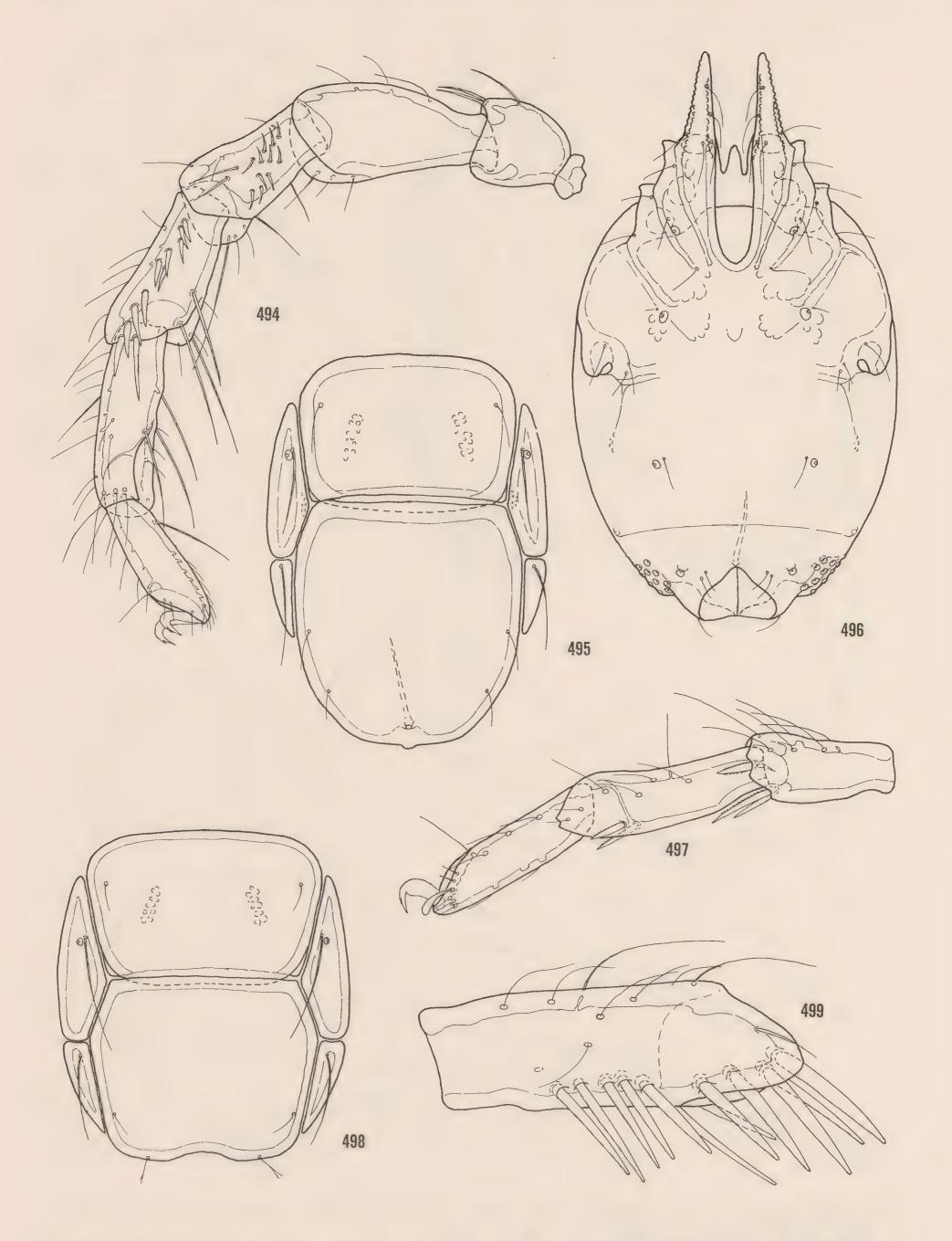
Uralbia gracilipes n. sp. Fig. 482, ventral shield, ♀; Fig. 483, fourth leg, ♂; Fig. 484, ventral shield, ♂; Fig. 485, dorsal shield, ♀; Fig. 486, dorsal shield, ♂; Fig. 487, distal segments of first leg, ♀.



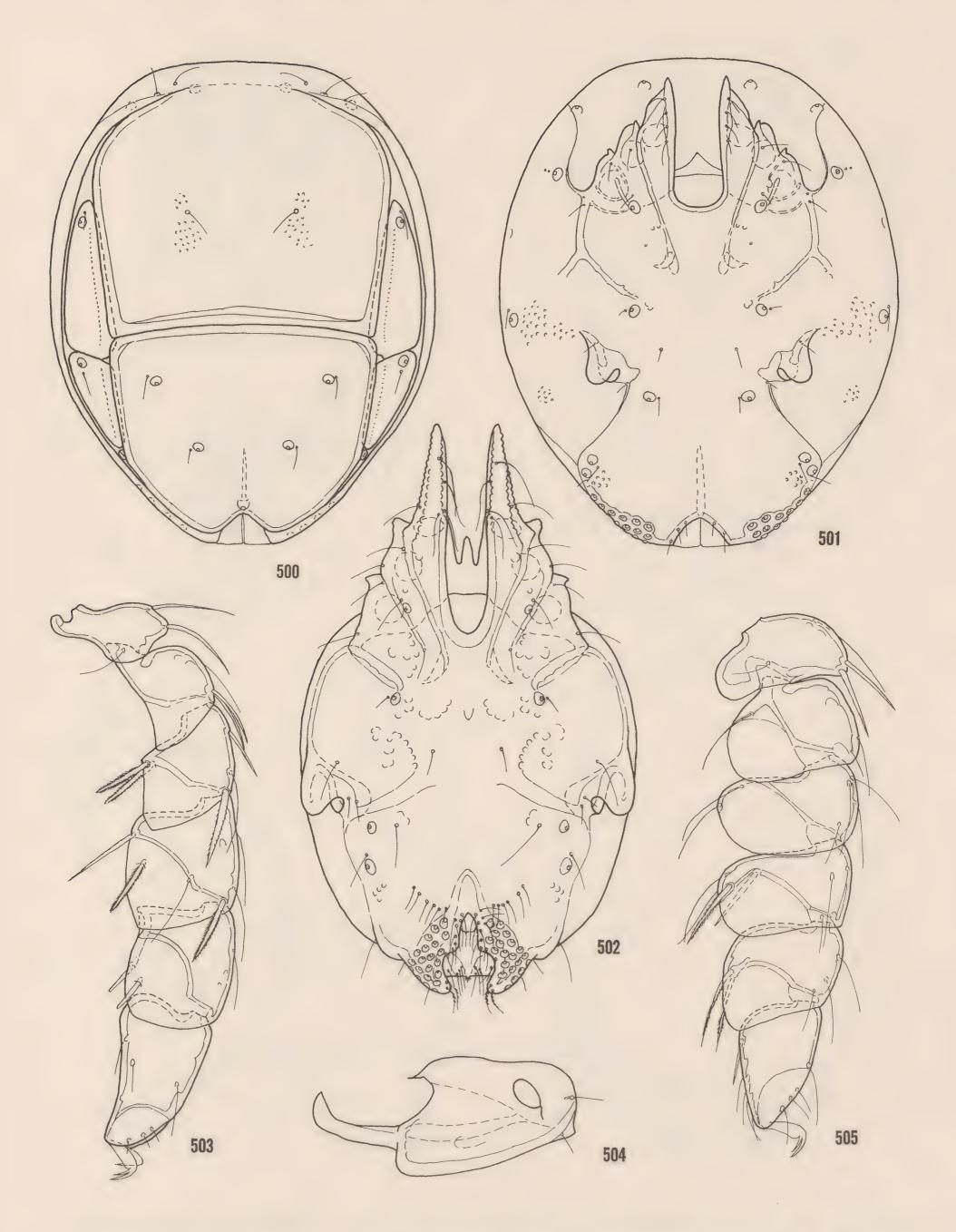
<u>Uralbia parva</u> n. sp. (Male) Fig. 488, fourth leg; Fig. 489, ventral shield; Fig. 490, dorsal shield; Fig. 493, palp.

Uralbia projecta Hopkins Fig. 491, lateral view of capitulum, chelicera and palp, \mathfrak{P} .

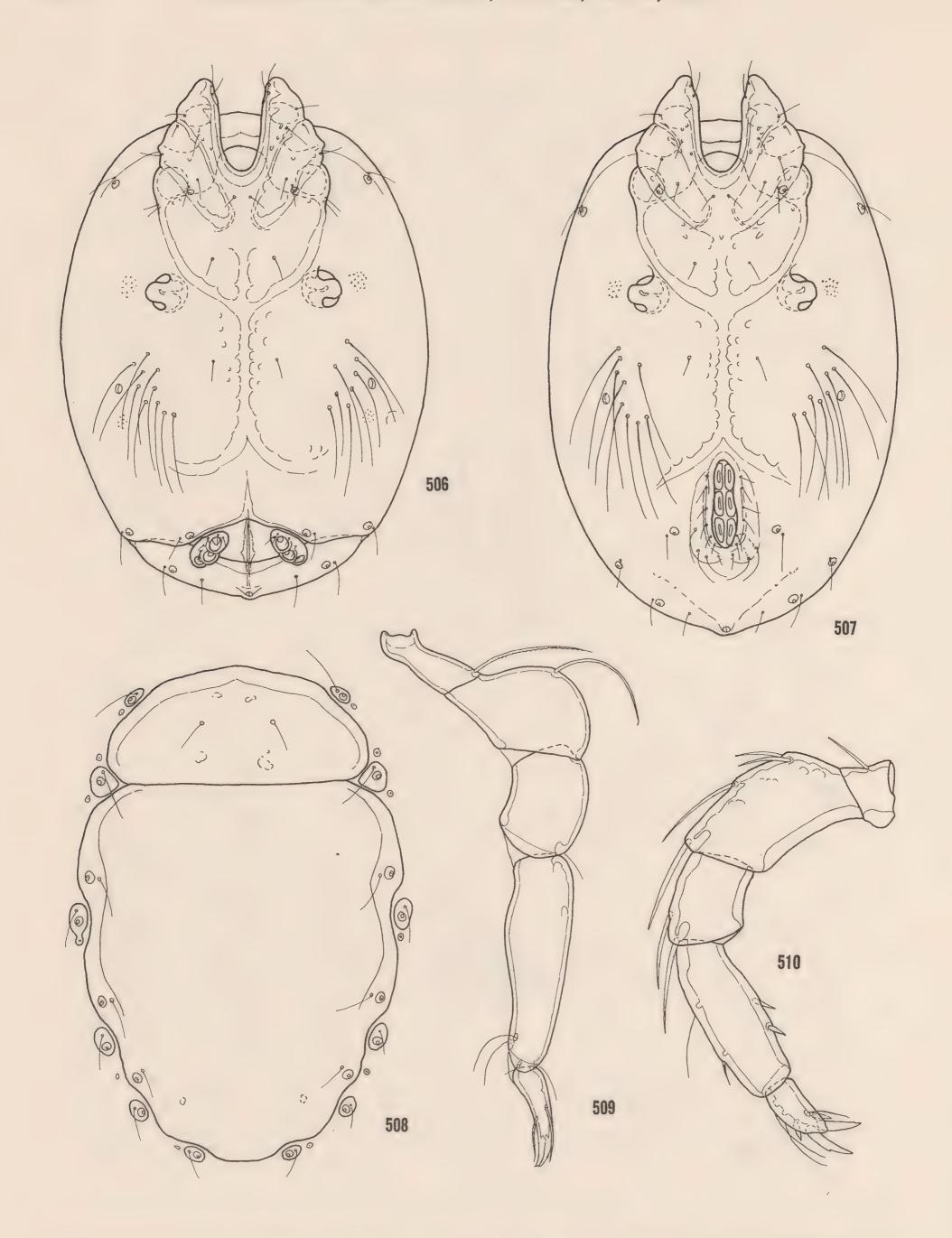
Uralbia gracilipes n. sp. Fig. 492, palp, ♀.



Uralbia projecta Hopkins Fig. 494, fourth leg, ♂; Fig. 495, dorsal shield, ♀; Fig. 496, ventral shield, ♀; Fig. 497, distal segments of first leg, ♀; Fig. 498, dorsal shield, ♂; Fig. 499, IV-Leg-4, ♂.

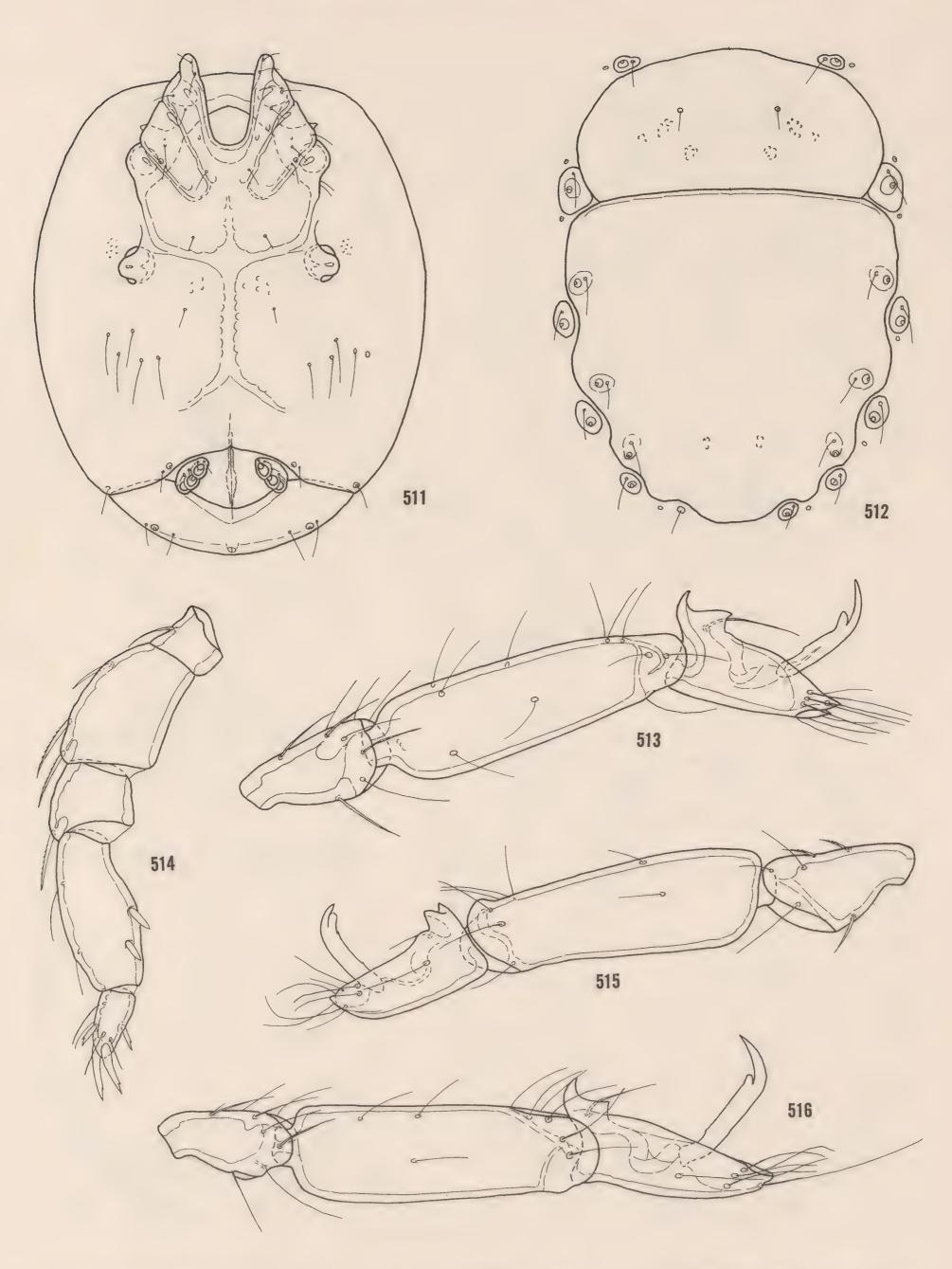


Zelandalbia imamurai n. sp. (Female) Fig. 500, dorsal shield, Fig. 501, ventral shield; Fig. 503, first leg; Fig. 504, capitulum; Fig. 505, fourth leg. Uralbia projecta Hopkins Fig. 502, ventral shield, of.



Neomomonia torquipes (Hopkins) Fig. 506, ventral shield, \$\partial\$; Fig. 507, ventral shield, \$\partial\$; Fig. 508, dorsal shield, \$\partial\$; Fig. 510, palp, \$\partial\$.

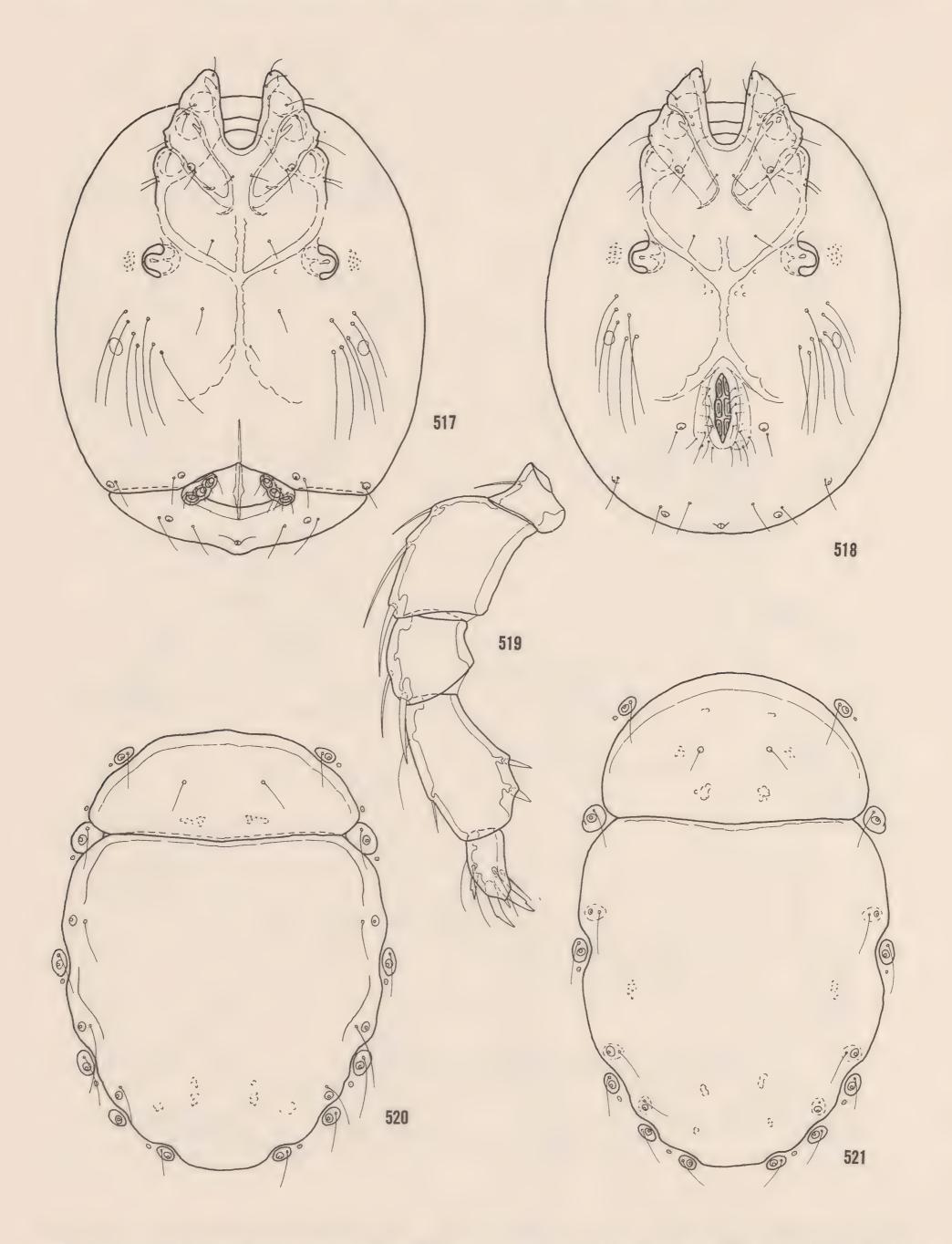
Zelandalbia imamurai n. sp. Fig. 509, palp, \$\partial\$.



Neomomonia hopkinsi n. sp. (Female) Fig. 511, ventral shield; Fig. 512, dorsal shield; Fig. 514, palp; Fig. 515, distal segments of first leg.

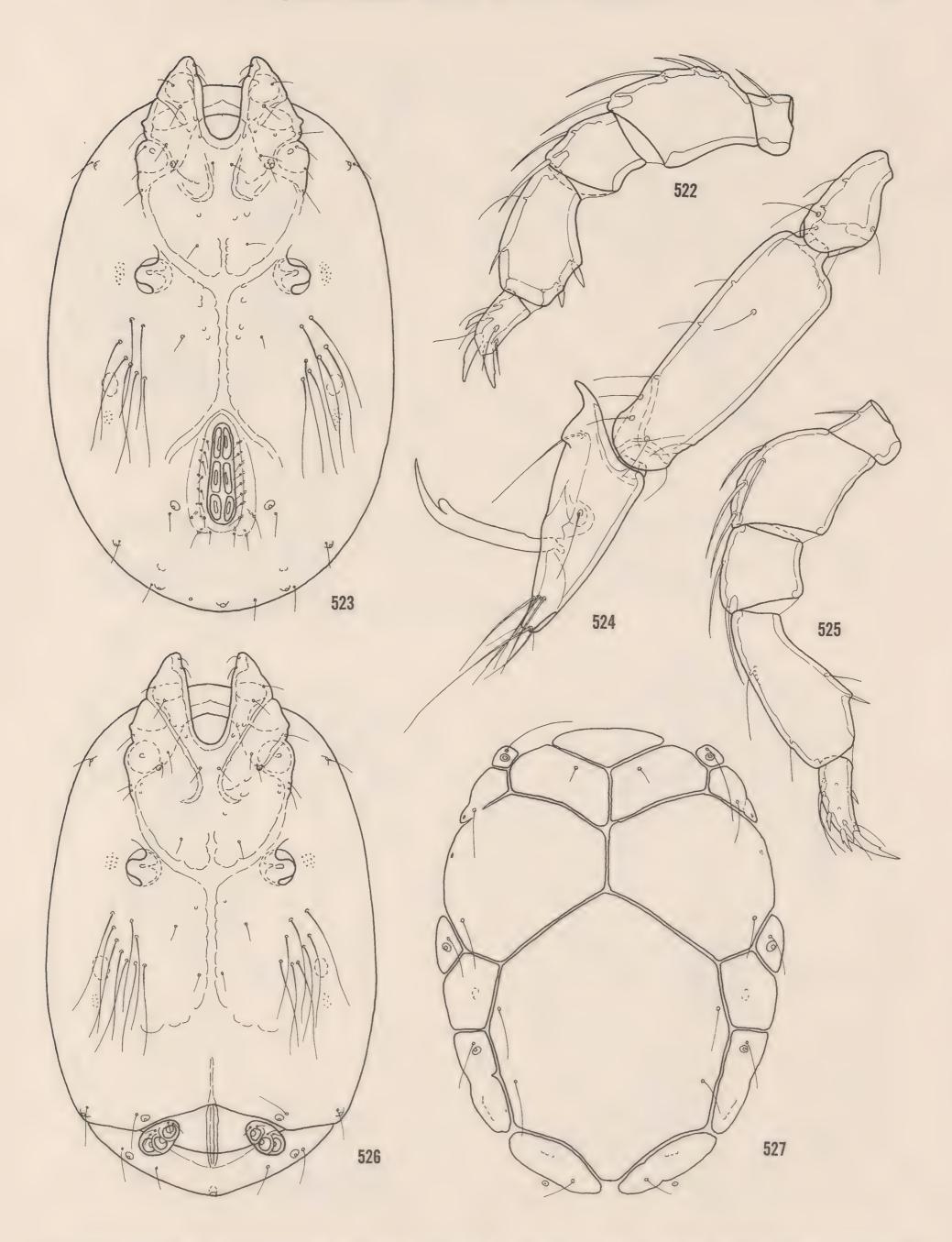
Neomomonia torquipes (Hopkins) Fig. 513, distal segments of first leg, \(\varphi\).

Neomomonia benova n. sp. Fig. 516, distal segments of first leg, \(\varphi\).



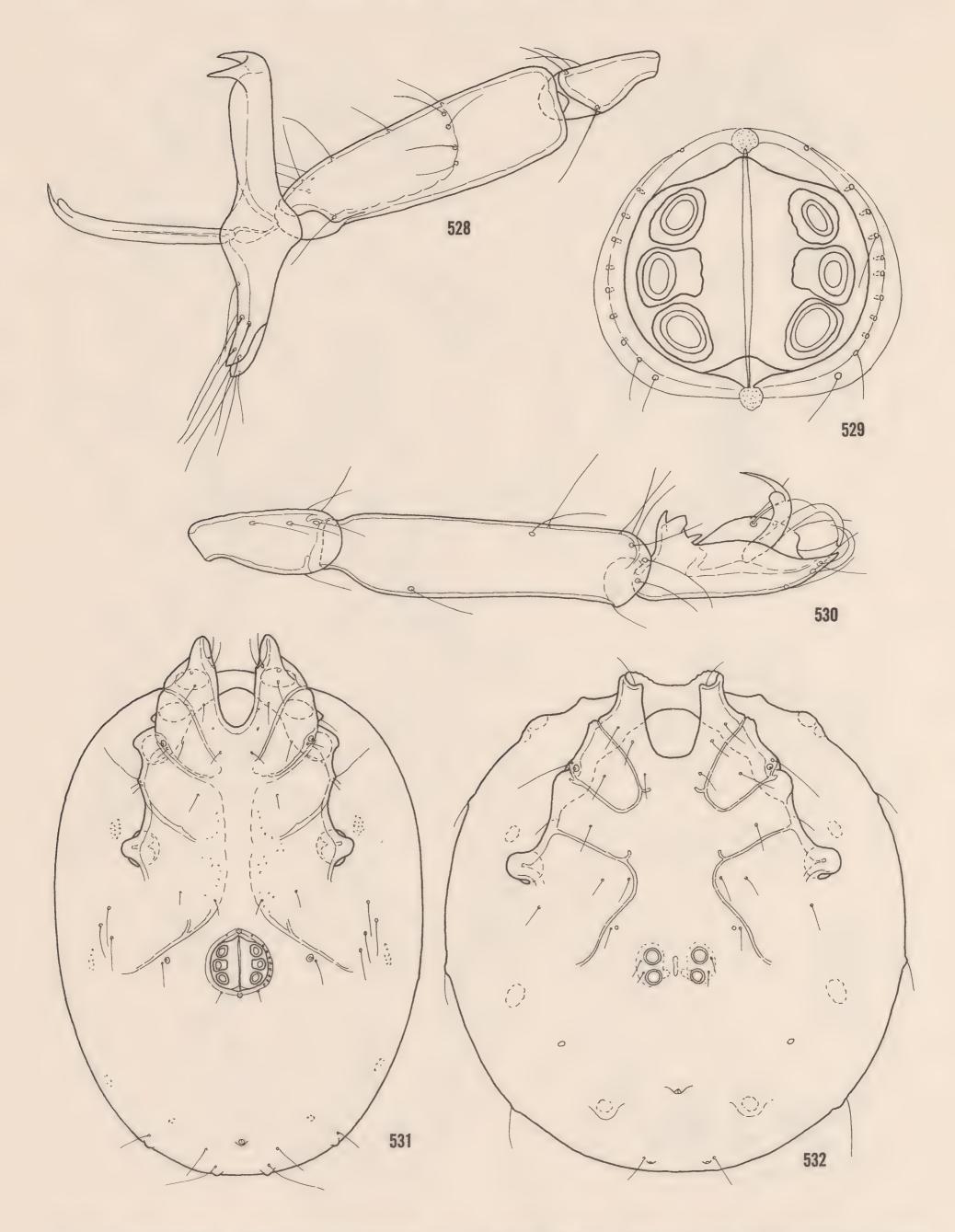
Neomomonia benova n. sp. Fig. 517, ventral shield, \(\parpli\); Fig. 518, ventral shield, \(\sigma\); Fig. 519, palp, \(\parpli\); Fig. 520, dorsal shield, \(\parpli\).

Neomomonia paramecia n. sp. Fig. 521, dorsal shield, \(\sigma\).



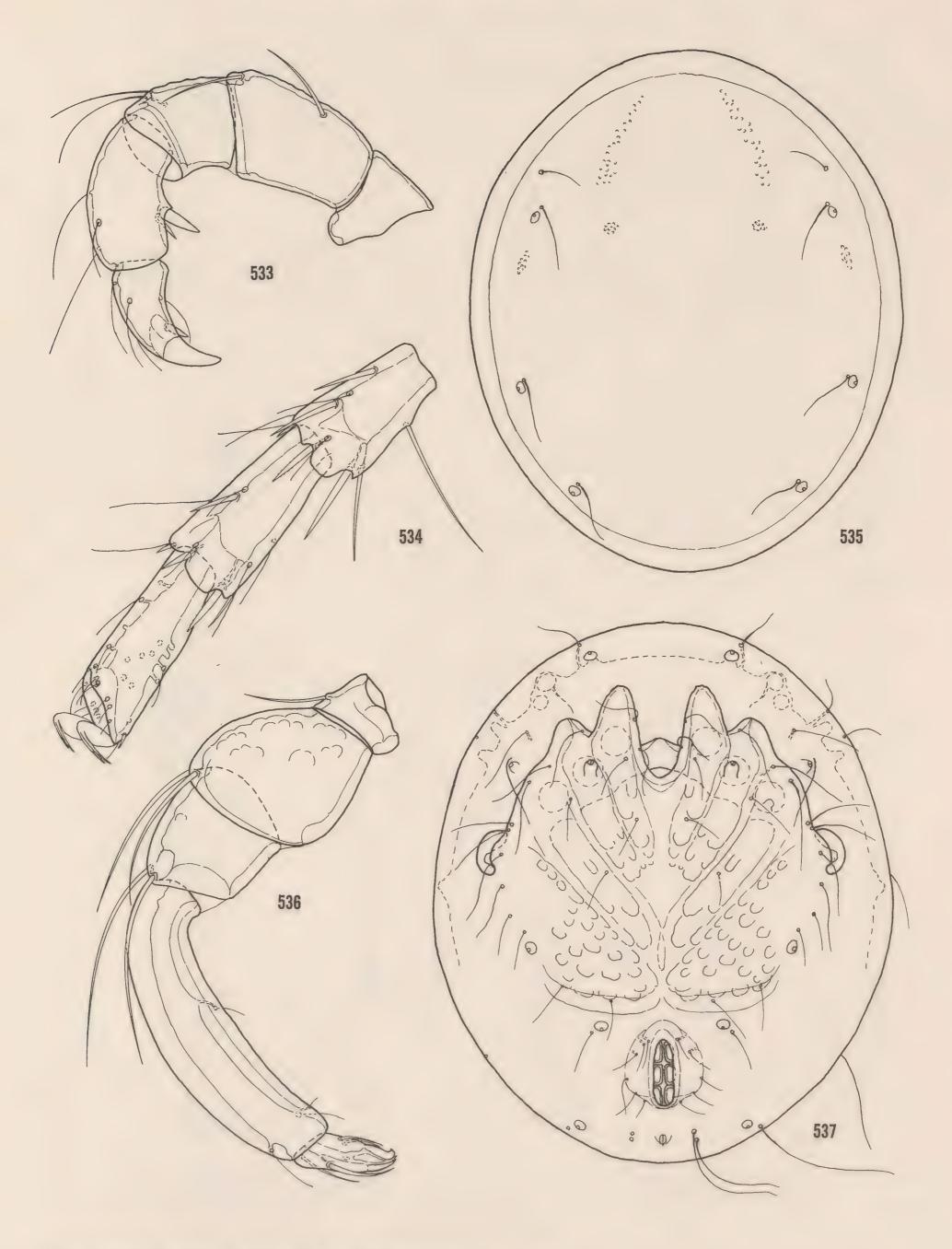
Neomomonia paramecia n. sp. Fig. 522, palp, o'; Fig. 523, ventral shield, o'; Fig. 524, distal segments of first leg, o'; Fig. 526, ventral shield, o'.

Partidomomonia polyplacophora n. sp. Fig. 525, palp, o'; Fig. 527, dorsal shield, o'.



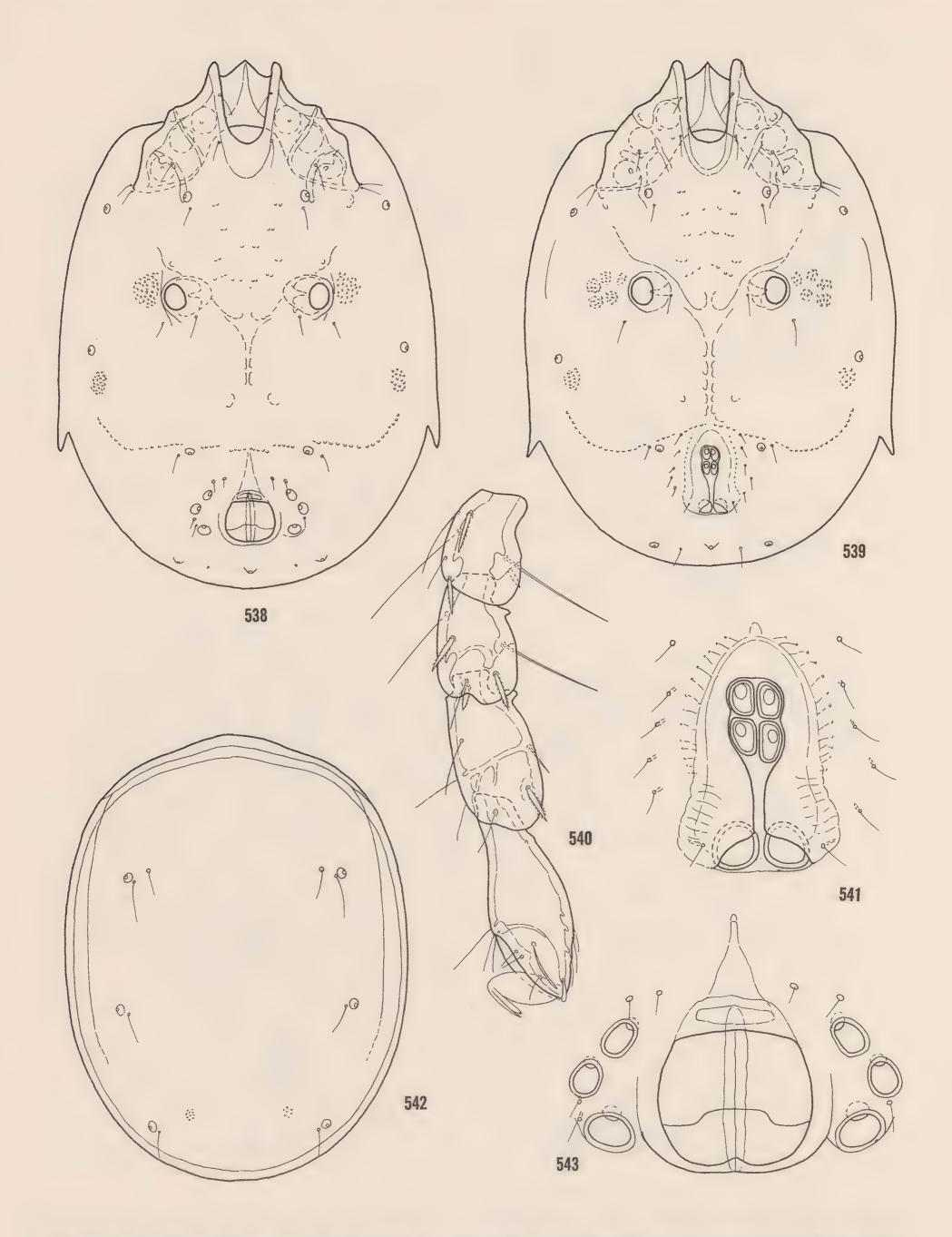
Partidomomonia polyplacophora n. sp. (Male) Fig. 528, distal segments of the first leg; Fig. 529, genital field; Fig. 531, ventral shield.

Momoniella sp. (Nymph) Fig. 530, distal segments of first leg; Fig. 532, ventral shield.

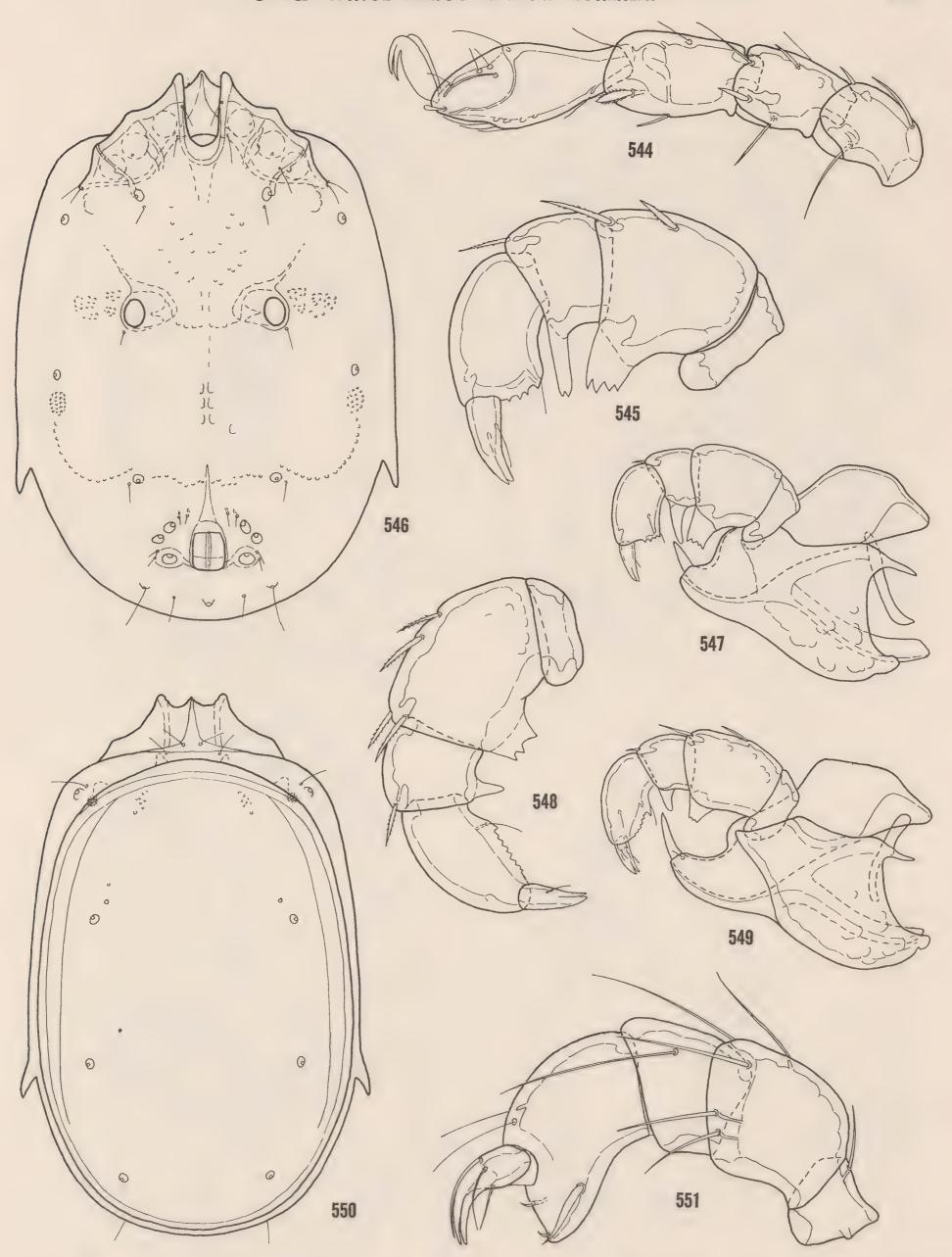


Momoniella sp. Fig. 533, palp, nymph.

Nudomideopsis forkensis (Imamura) (Male) Fig. 534, distal segments of first leg; Fig. 535, dorsal shield; Fig. 536, palp; Fig. 537, ventral shield.



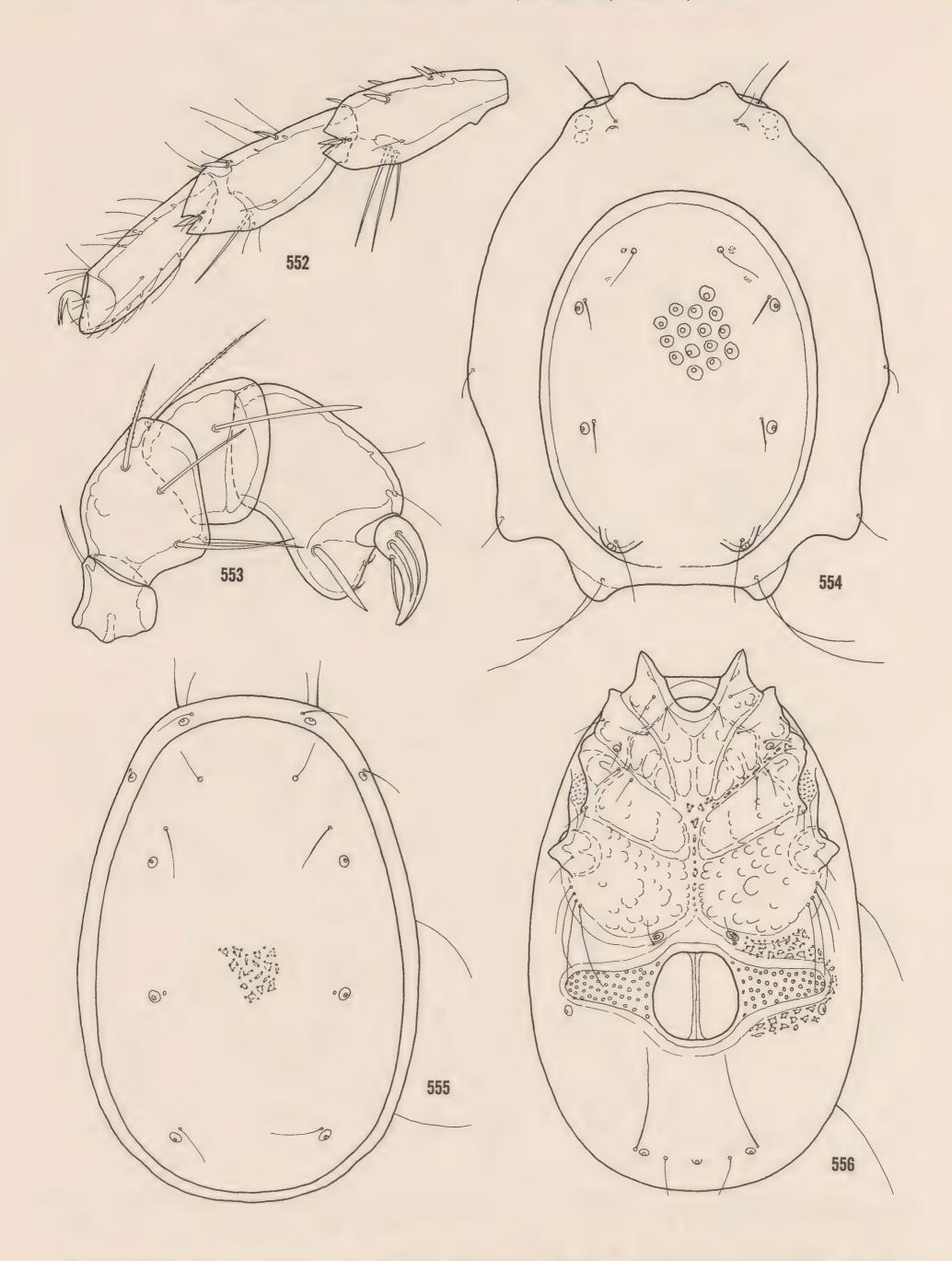
Austramideopsoides serratipalpis n. sp. Fig. 538, ventral shield, \$\partial\$; Fig. 539, ventral shield, \$\partial\$; Fig. 540, distal segments of first leg, \$\partial\$; Fig. 541, genital field area, \$\partial\$; Fig. 542, dorsal shield, \$\partial\$; Fig. 543, genital field area, \$\partial\$.



Austramideopsoides ramsayi n. sp. (Female) Fig. 544, distal segments of first leg; Fig. 545, palp; Fig. 546, ventral shield; Fig. 547, lateral view of capitulum, chelicera and palp; Fig. 550, dorsal view.

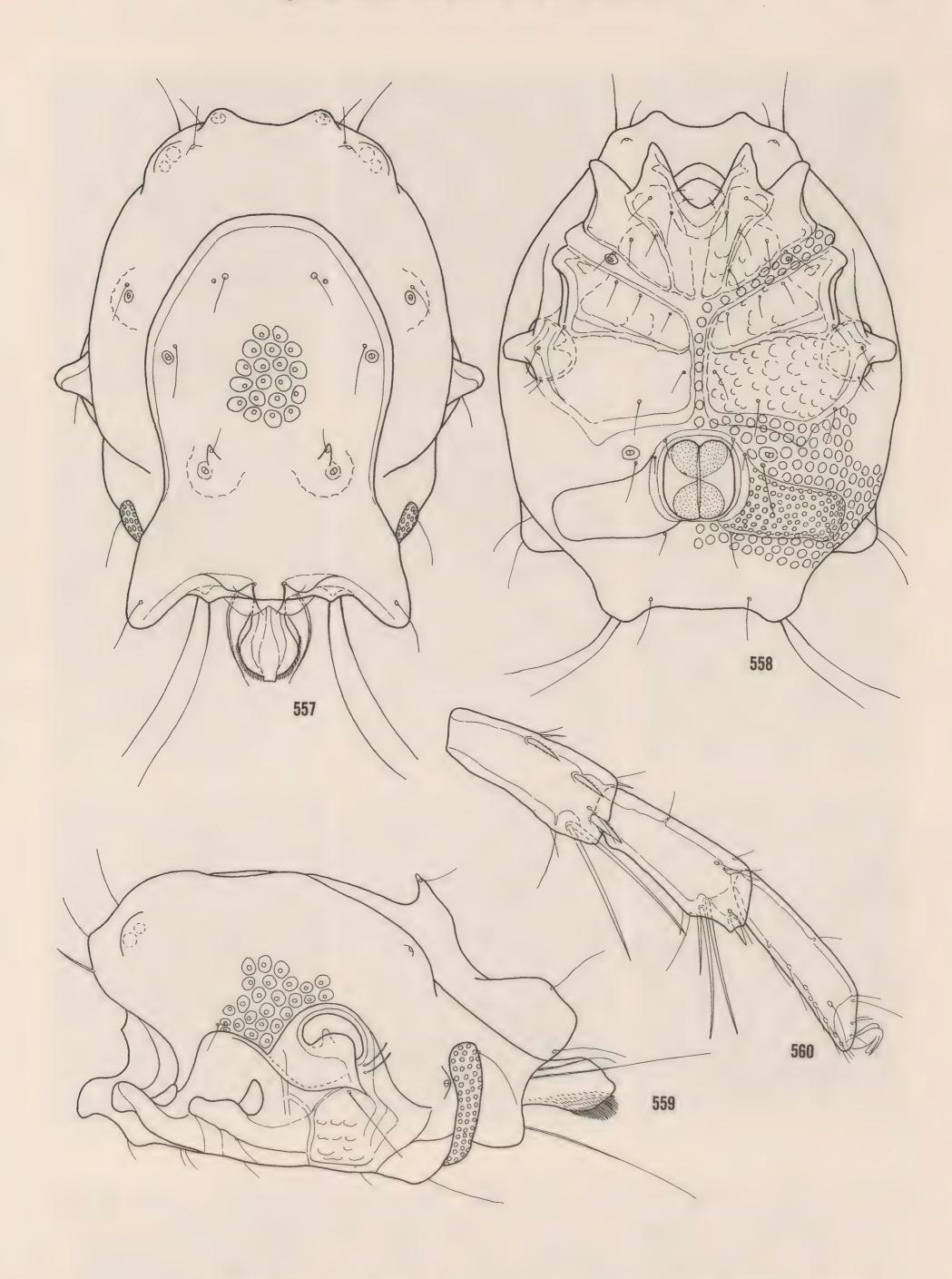
Austramideopsoides serratipalpis n. sp. Fig. 548, palp, \(\parphi\); Fig. 549, lateral view of capitulum, chelicera and palp, \(\parphi\).

Arrenurus zelandicus n. sp. Fig. 551, palp, \cong2.

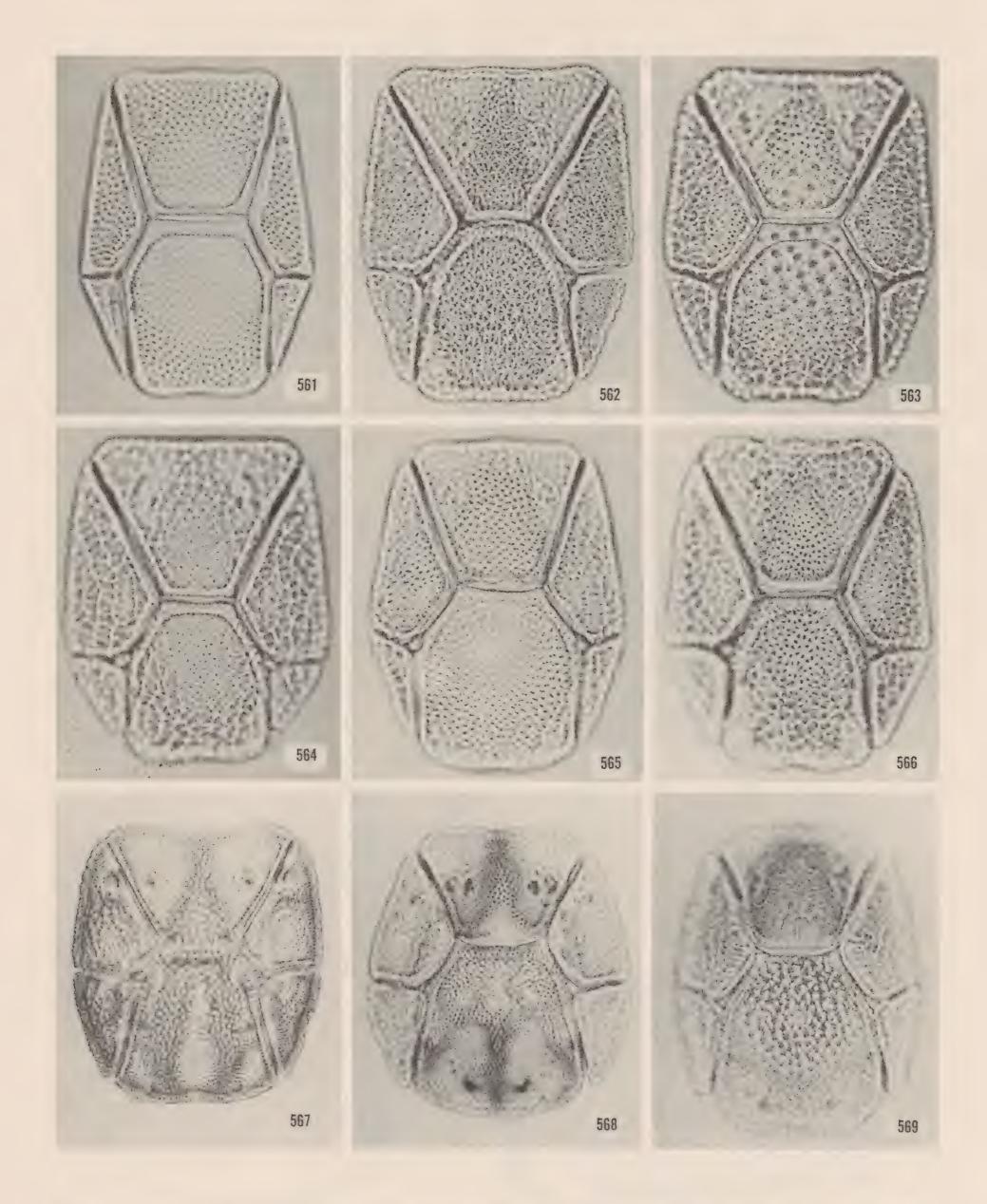


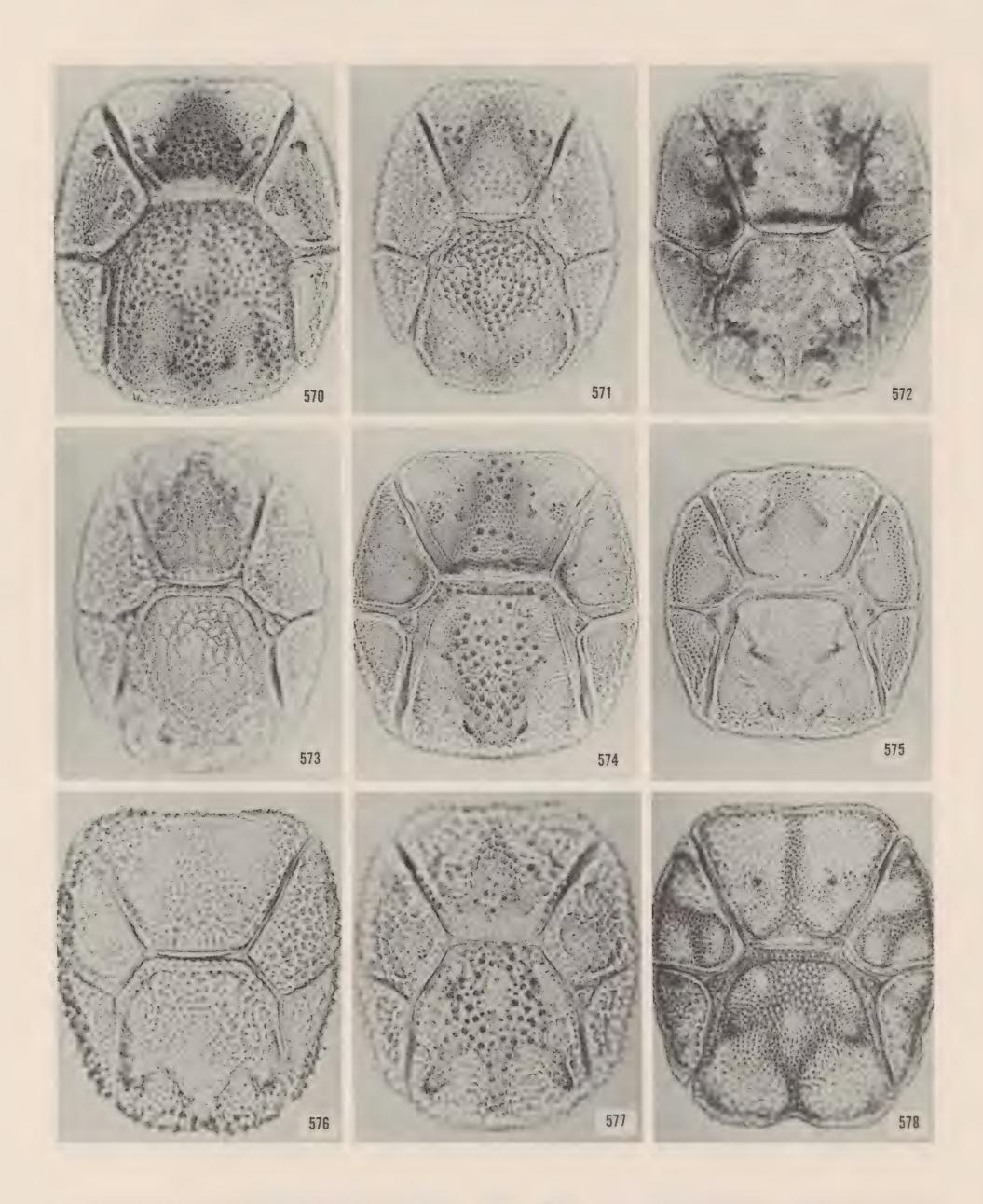
Arrenurus zelandicus n. sp. (Female) Fig. 552, distal segments of first leg; Fig. 555, dorsal view; Fig. 556, ventral shield.

Arrenurus stouti n. sp. Fig. 553, palp, ♀; Fig. 554, dorsal view, ♀.

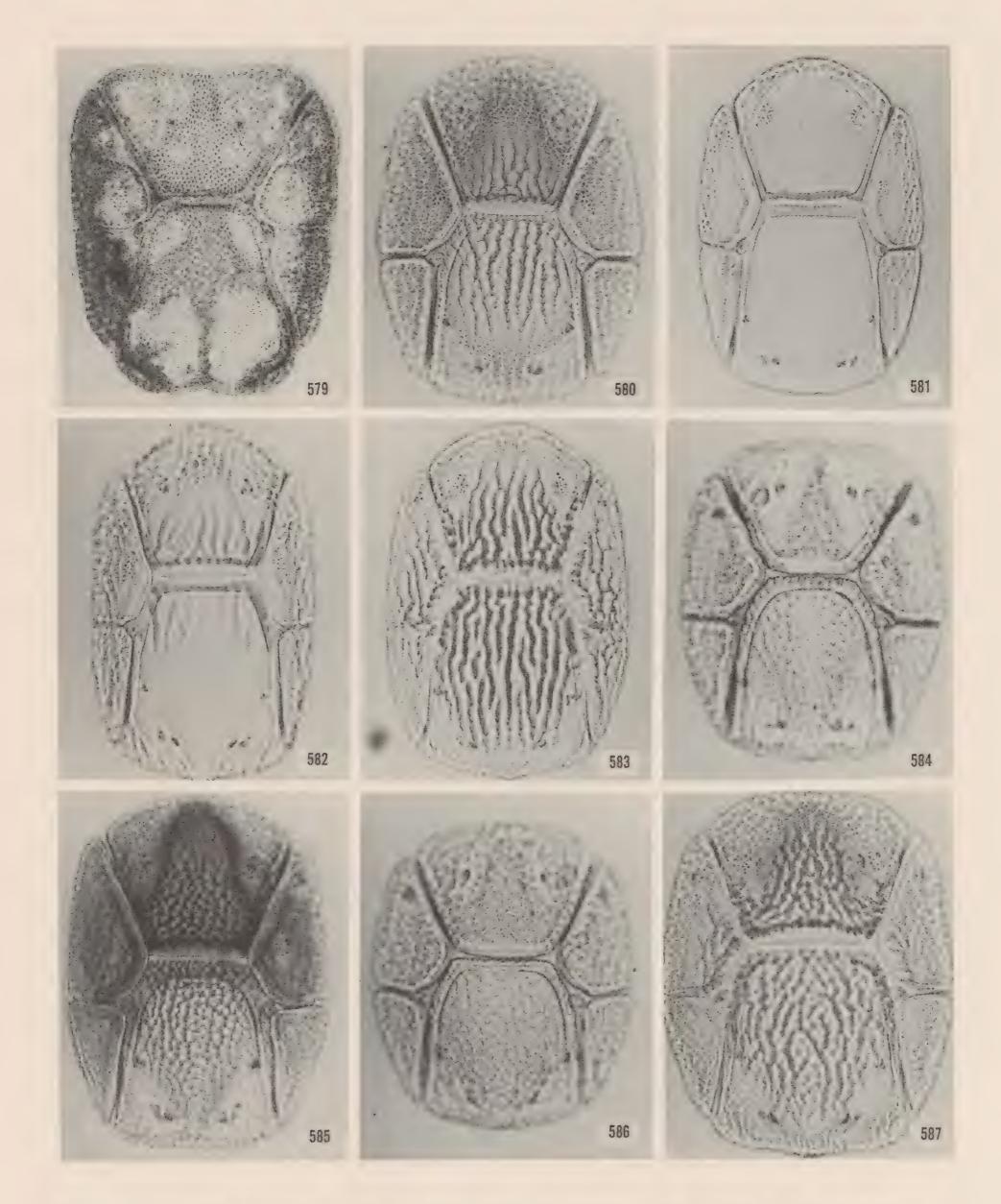


Arrenurus stouti n. sp. Fig. 557, dorsal view, ♂; Fig. 558, ventral shield, ♀; Fig. 559, lateral view, ♂; Fig. 560, distal segments of first leg, ♀.

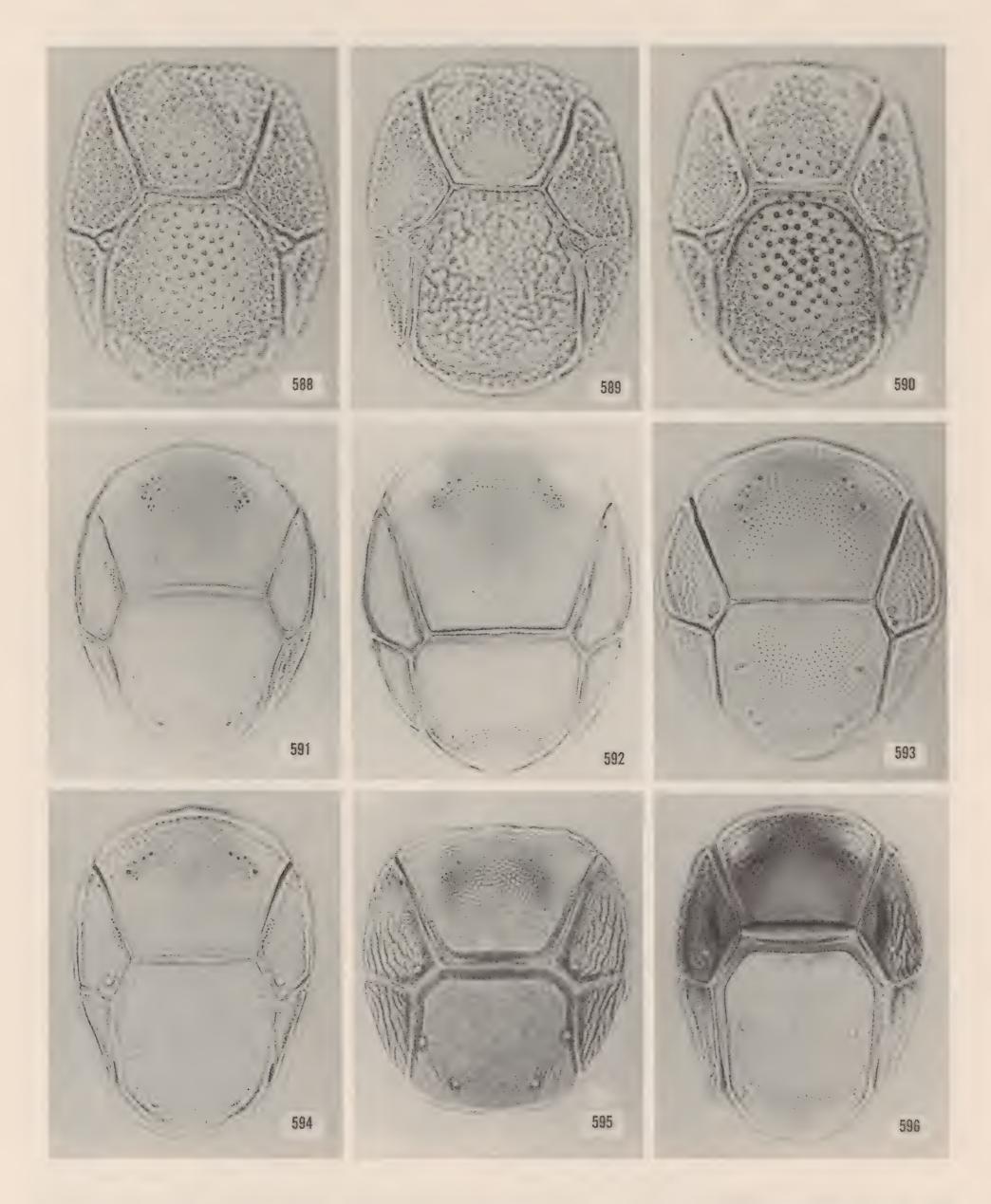




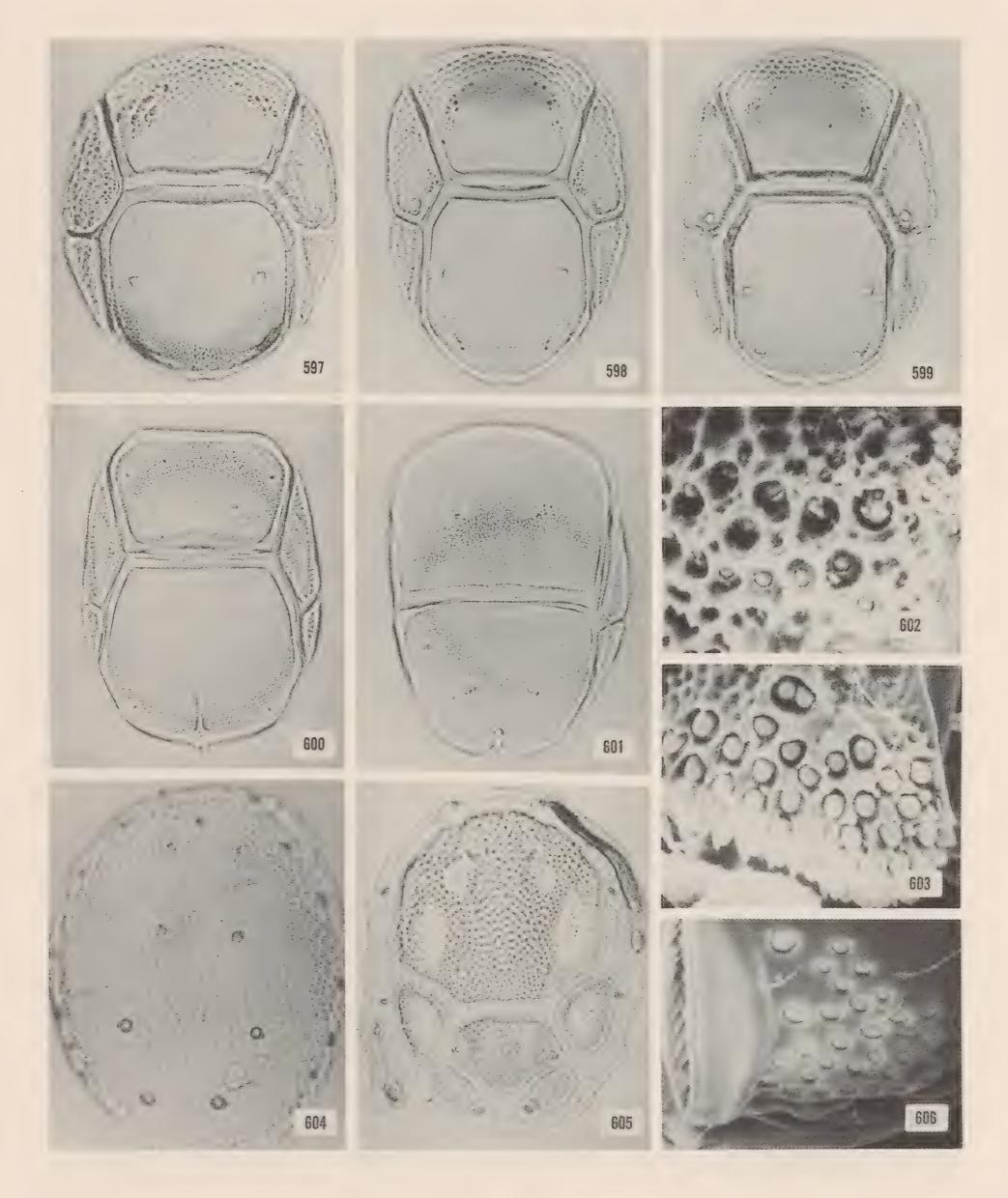
Photographs of dorsal shields. Fig. 570, Tryssaturopsis parvicaudatus n. sp., \$\partial\$; Fig. 571, Tryssaturopsis solivagus n. sp., \$\partial\$; Fig. 572, Pilosaturus villosus (Hopkins), \$\partial\$; Fig. 573, Tryssaturus spinipes Hopkins, \$\partial\$; Fig. 574, Neotryssaturus pallidus n. sp., \$\partial\$; Fig. 576, Evidaturus exilis n. sp., \$\partial\$; Fig. 577, Evidaturus exilis n. sp., \$\partial\$; Fig. 578, Piotaturus alvecaudatus n. sp., \$\partial\$.



Photographs of dorsal shields. Fig. 579, Piotaturus bovalus n. sp., $\$; Fig. 580, Pseudotryssaturus indentatus (Hopkins), $\$; Fig. 581, Pseudotryssaturus planus n. sp., $\$; Fig. 582, Pseudotryssaturus anchistus n. sp., $\$; Fig. 583, Pseudotryssaturus anchistus n. sp., $\$; Fig. 584, Pseudotryssaturus papillidermis n. sp., $\$; Fig. 585, Pseudotryssaturus dapsilus n. sp., $\$; Fig. 586, Pseudotryssaturus acutus n. sp., $\$; Fig. 587, Pseudotryssaturus dictydermis n. sp., $\$.



Photographs of dorsal shields Fig. 588, Paratryssaturus minutus (Hopkins), \$\varphi\$; Fig. 589, Paratryssaturus zodelus n. sp., \$\varphi\$; Fig. 590, Paratryssaturus cantermus n. sp., \$\varphi\$; Fig. 591, Kritaturus jacundus n. sp., \$\varphi\$; Fig. 592, Kritaturus tenonus n. sp., \$\varphi\$; Fig. 593, Kritaturus rucabus n. sp., \$\varphi\$; Fig. 594, Kritaturus uncipalpis n. sp., \$\varphi\$; Fig. 595, Kritaturus sornus n. sp., \$\varphi\$; Fig. 596, Kritaturus ianthus n. sp., \$\varphi\$.



Photographs of dorsal shields, unless otherwise specified. Fig. 597, Kritaturus gennadus n. sp., φ ; Fig. 598, Kritaturus dornarus n. sp., φ ; Fig. 599, Kritaturus vinnulus n. sp., φ ; Fig. 600, Uralbia gracilipes n. sp., φ ; Fig. 601, Zelandalbia imamurai n. sp., φ ; Fig. 602, Taintaturus hopkinsi n. sp., posterior view of acetabula, φ ; Fig. 603, Pseudotryssaturus indentatus (Hopkins), posterior view of acetabula, φ ; Fig. 604, Zelandobatella naias Hopkins, dorsum, φ ; Fig. 605, Zelandobates clevatus n. sp., σ ; Fig. 606, Kritaturus jacundus n. sp., posterior view of acetabula, φ .

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* An asterisk indicates a synonym. The main rererence is underscored.

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